THE

LELAND STANFORD JUNIOR

UNIVERSITY

REGISTER FOR 1893-94

PALO ALTO, CALIFORNIA
PUBLISHED BY THE UNIVERSITY
APRIL, 1894

THE

LELAND STANFORD JUNIOR

UNIVERSITY

THIRD ANNUAL REGISTER

1893-1894

"The Beneficence of the Creator towards Man on Earth, and the possibilities of Humanity, are one and the same."—LELAND STANFORD.

"A generous Education is the Birthright of every man and woman in America."

PALO ALTO, CALIFORNIA
PUBLISHED BY THE UNIVERSITY
APRIL, 1894.

TABLE OF CONTENTS.

PAGE

CALENDAR 5
FOUNDERS AND TRUSTEES 6
FACULTY AND OTHER OFFICERS 7
ORGANIZATION AND ADMINISTRATION 19
ADMISSION AND GRADUATION 26
DEPARTMENTS AND COURSES OF INSTRUCTION:
Greek 43
Latin 45
Archæology 49
German 50
Romanic Languages 53
English 56
Psychology 64
Ethics 64
Education 67
History 69
Economics and Social Science 74
Law 77
Mathematics 80
Astronomy 83
Physics 85
Chemistry 86
Botany 89
Entomology 91
Horticulture 92
Physical Training and Hygiene 93
Physiology and Histology 95
Zoology 98
Geology 99
Mining Engineering 100
Drawing and Painting 101
Civil Engineering 103
Mechanical Engineering 108
Electrical Engineering 110
Military Science and Tactics 112
University Extension 112

University Lectures 113
The University Chapel 114
University Associations 115
Hopkins Seaside Laboratory 116
Summer Courses 119
CATALOGUE OF STUDENTS 122
SECOND ANNUAL COMMENCEMENT 151
ALUMNI ASSOCIATION 154
INDEX 155

DIRECTORY.

[The rooms in the Quadrangle are numbered consecutively beginning at the left of the main entrance, ten numbers being allotted to each building. Numbers 120 to 160 are in the Engineering buildings, south of the Quadrangle.]

The office of the *President* is room 112.

The office of the Registrar is room 110.

The *Library* is room 2.

UNIVERSITY CALENDAR.

1893

Sept.	4	Monday	Entrance examinations begin.
Sept.	5-6	Tues.-Wed	Registration of Matriculated Students.
Sept.	7	Thursday	Registration of New Students. Instruction begins.
Nov.	30	Thursday	Thanksgiving Recess.
Dec.	3	Sunday	
Dec.	21	Thursday	First Semester ends.

1894

Jan.	8	Monday	Registration for Second Semester.
Jan.	9	Tuesday	Instruction begins.
Feb.	22	Thursday	Washington's Birthday.
Mar.	9	Friday	Founder's Day.
Mar.	23	Friday	Midwinter Fair Day.
Mar.	24	Saturday	Easter Recess.
Apr.	1	Sunday	
May	14	Monday	Memorial Day.
May	23	Wednesday	Instruction ends.
May	24	Thursday	Entrance Examinations at Palo Alto and other appointed places.
May	26	Saturday	
May	27	Sunday	Baccalaureate Sermon.
May	28	Monday	Class Day.
May	29	Tuesday	Alumni Day.
May	30	Wednesday	Commencement.

Sept.	3	Monday	Entrance Examinations at Palo Alto begin.
Sept.	4	Tuesday	Registration of Matriculated Students.
Sept.	5	Wednesday	
Sept.	6	Thursday	Registration of New Students.
Sept.	7	Friday	Instruction begins.
Nov.	24	Thursday	Thanksgiving Recess.
Nov.	27	Sunday	
Dec.	21	Friday	First Semester ends.

1895

Jan.	7	Monday	Registration for Second Semester.
May	29	Wednesday	Commencement.

FOUNDERS.

*LELAND STANFORD. JANE LATHROP STANFORD.

BOARD OF TRUSTEES.

The Hon. FRANCIS E. SPENCER, Chairman.....San Jose
The Hon. CHARLES GOODALL.....San Francisco
The Hon. ALFRED L. TUBBS.....San Francisco
Col. CHARLES F. CROCKER.....San Francisco
Mr. TIMOTHY HOPKINS.....San Francisco
The Hon. HENRY L. DODGE.....San Francisco
Mr. IRVING M. SCOTT.....San Francisco
Dr. HARVEY W. HARKNESS.....San Francisco
The Hon. HORACE DAVIS.....San Francisco
The Hon. JOHN BOGGS.....Colusa
The Hon. T. B. MCFARLAND.....Sacramento
The Hon. ISAAC S. BELCHER.....San Francisco
The Hon. GEORGE E. GRAY.....San Francisco
The Hon. NATHAN W. SPAULDING.....Oakland
The Hon. WILLIAM M. STEWART.....Virginia City, Nev.
The Hon. STEPHEN J. FIELD.....Washington, D. C.
The Rev. HORATIO STEBBINS, D. D.....San Francisco
Mr. JOSEPH D. GRANT.....San Francisco
Mr. S. F. LEIB.....San Jose
Mr. LEON SLOSS.....San Francisco
Dr. EDWARD R. TAYLOR.....San Francisco
Mr. THOMAS WELTON STANFORD.....Melbourne, Australia
Mr. FRANK MILLER.....Sacramento
Mr. CHARLES G. LATHROP.....San Francisco

HERBERT C. NASH, Secretary.

*Died June 21, 1893.

Faculty and Other Officers.

FACULTY.

[*Arranged in groups in the order of seniority of appointment.*]

DAVID STARR JORDAN, President of the University.

Xazmin House, Serra Ave.

M. S., Cornell University, 1872; M. D., Indiana Medical College, 1875; Ph. D., Butler University, 1878; LL. D., Cornell University, 1886. Instructor in Botany, Cornell University, 1871-72; Professor of Natural History, Lombard University, 1872-73; Principal of Appleton (Wis.) Collegiate Institute, 1873-74; Student and afterward Lecturer in Marine Botany, Anderson School at Penikese, 1874; Teacher of Natural History, Indianapolis High School, 1874-75; Professor of Biology, Butler University, 1875-79; Assistant to the U. S. Fish Commission, 1877-91; Professor of Zoology, Indiana University, 1879-85; President of Indiana University, 1885-91.

*ANDREW DICKSON WHITE, Non-Resident Professor of European History. *Ithaca, N. Y.*

A. B., Yale, 1853; A. M., 1856; Ph. D., University of Jena; LL. D., Michigan, Cornell, and Yale; L. H. D., Columbia College. Student at Berlin and Paris, 1853-56; Attaché of the American Legation at St. Petersburg, 1856; Professor of History and English Literature, University of Michigan, 1857-62; Member of the State Senate of New York, 1863-66; President of Cornell University and Professor of History, 1866-85; Envoy Extraordinary and Minister Plenipotentiary to the German Empire, 1879-81, to Russia, since 1892.

BENJAMIN HARRISON, Non-Resident Professor of Constitutional Law. *Indianapolis, Ind.*

A. B. and LL. D., Miami University; Brevet Brigadier-General, U. S. A., 1865; U. S. Senator from Indiana, 1881-1887; President of the United States, 1889-93.

GEORGE ELLIOTT HOWARD, Professor of History.

20 Alvarado Row.

A. B., University of Nebraska, 1876; A. M., 1879; Ph. D., 1894. Student in History and Jurisprudence, Universities of Munich and Paris, 1876-78; Professor of History, University of Nebraska, 1879-91; Secretary of the Nebraska State Historical Society, 1885-91.

JOHN CASPER BRANNER, Professor of Geology.

28 Alvarado Row.

B. S., Cornell University, 1882; Ph. D., Indiana University, 1885. Assistant Geologist, Imperial Geological Survey of Brazil, 1875-78; Special Botanist for Thomas A. Edison in South America, 1880-81; Special Agent of the U. S. Department of Agriculture for Investigating Cotton and the Insects affecting it in Brazil, 1882-83; Topographical Geologist of the Geological Survey of Pennsylvania, Anthracite District, 1883-85; Professor of Geology, University of Indiana, 1885-91; State Geologist of Arkansas, 1887-92.

* Absent as United States Minister to Russia.

OLIVER PEEBLES JENKINS, Professor of Physiology and Histology.
Cedro Cottage.

A. B., Moore's Hill College, 1869; A. M., 1872; M. S., Indiana University, 1886; Ph. D., 1889. Professor of Natural Science, Moore's Hill College, 1876-82; Professor of Natural Science, Indiana State Normal School, 1883-86; Professor of Biology, De Pauw University, 1886-91.

*JOHN HENRY COMSTOCK, Professor of Entomology.

B. S., Cornell University, 1874. Instructor in Entomology, Cornell University, 1873-77, Assistant Professor, 1877-82; U. S. Entomologist, at Washington, 1879-81; Professor of Entomology and General Invertebrate Zoology, Cornell University, since 1882.

MELVILLE BEST ANDERSON, Professor of English Literature.
19 Salvatierra St.

A. M., Butler University, 1877. Professor of Modern Languages, Butler University, 1877-80; Professor of English Literature, Knox College, 1881-86; Professor of Literature and History, Purdue University, 1886-87; Professor of the English Language and Literature, University of Iowa, 1887-91.

JOHN MAXSON STILLMAN, Professor of Chemistry.
2 Alvarado Row.

Ph. B., University of California, 1874; Ph. D., 1885. Assistant in Chemistry, University of California, 1873-75; Student in Chemistry, Strassburg and Würzburg, 1875-76; Instructor in Organic and General Chemistry, University of California, 1876-82; Chemist of the Boston and American Sugar Refining Company, 1882-92.

FERNANDO SANFORD, Professor of Physics.
8 Alvarado Row.

B. S., Carthage College, 1879; M. S., 1882. Student, University of Berlin, 1886-88; Professor of Physical Science, Mt. Morris College, 1879-82; Superintendent of Schools, Ogle County, Ill., 1882-86; Instructor in Physics and Chemistry, Englewood High School, 1888-90; Professor of Physical Science, Lake Forest University, 1890-91.

CHARLES DAVID MARX, Professor of Civil Engineering.
Palo Alto.

B. C. E., Cornell University, 1878; C. E., Karlsruhe Polytechnicum, 1881. Instructor in Civil Engineering, Karlsruhe Polytechnicum, 1880-81; U. S. Assistant Engineer, Missouri River Improvement, 1882-84; Assistant Professor of Civil Engineering, Cornell University, 1884-90; Professor of Civil Engineering, University of Wisconsin, 1890-91.

ERNEST MONDELL PEASE, Professor of the Latin Language and Literature. *6 Alvarado Row.*

A. B., University of Colorado, 1882; A. M., 1885. Fellow in Johns Hopkins University, 1884-86; Student at Bonn, 1885, 1891; Instructor in Latin, Smith College, 1886; Professor of Latin, Bowdoin College, 1886-91.

CHARLES HENRY GILBERT, Professor of Zoology.
23 Salvatierra St.

B. S., Butler University, 1879; M. S., Indiana University, 1882; Ph. D., 1883. Assistant in Natural Sciences and Modern Languages, Indiana University, 1880-84; Professor of Natural History, University of Cincinnati, 1884-88; Professor of Zoology, Indiana University, 1888-91; Assistant to the U. S. Fish Commission, 1880-91.

*Absent on leave, 1893-94.

DOUGLAS HOUGHTON CAMPBELL, Professor of Botany.

33 Alvarado Row.

Ph. M., University of Michigan, 1882; Ph. D., 1886. Teacher of Biology, Detroit High School, 1882-86; Student at Bonn, Tübingen, and Berlin, 1886-88; Professor of Botany, Indiana University, 1888-91.

EARL BARNES, Professor of Education, and Secretary of the Faculty.

12 Alvarado Row.

A. B., Indiana University, 1890; M. S., Cornell University, 1891. Student in History and Psychology, Cornell University, 1886-87, '88-89; Student in Pedagogics, University of Zürich, 1887-88; Professor of History, Indiana University, 1889-91.

EDWIN HAMLIN WOODRUFF, Librarian.

33 Alvarado Row.

LL. B., Cornell University, 1888. Assistant, Astor Library, 1883-84; Chief Cataloguer, Cornell University Library, 1884-88; Instructor in English, Cornell University, 1888-90; Librarian of the Fiske Library, Florence, Italy, 1890-91.

THOMAS DENISON WOOD, Professor of Physical Training and Hygiene. *10 Alvarado Row.*

A. B., Oberlin College, 1888; A. M., 1891; M. D., College of Physicians and Surgeons, New York City, 1891. Director, Oberlin College Gymnasium, 1886-88.

ALBERT WILLIAM SMITH, Professor of Mechanical Engineering.

Palo Alto.

B. M. E., Cornell University, 1878; M. M. E., 1886. Machinist and Contractor with Brown & Sharp Mfg. Co., Providence, R. I., 1879-80; Machinist and Shop Foreman, Straight Line Engine Works, Syracuse, N. Y., 1880-83; Superintendent, Kingsford Foundry and Machine Works, Oswego, N. Y., 1883-86; Fellow in Mechanical Engineering, Cornell University, 1886-87, Assistant Professor, 1887-91; Professor of Machine Design, University of Wisconsin, 1891-92.

EWALD FLÜGEL, Professor of English Philology.

2 Portola Ave.

Ph. D., University of Leipzig, 1886. Student, Universities of Freiburg and Leipzig, 1882-88; Privat Docent, University of Leipzig, 1888-92.

CHARLES BENJAMIN WING, Professor of Structural Engineering.

Palo Alto.

C. E., Cornell University, 1886. Fellow in Civil Engineering, Cornell University, 1886-87, Instructor, 1887-90, Assistant Professor, 1890-91; Professor of Bridge and Hydraulic Engineering, University of Wisconsin, 1891-92.

FRANK ANGELL, Professor of Psychology.

Palo Alto.

B. S., University of Vermont, 1878; Ph. D., University of Leipzig, 1891. Teacher in Washington (D. C.) High School, 1880-87; Assistant Professor of Psychology, Cornell University, 1891-92.

LEANDER MILLER HOSKINS, Professor of Applied Mechanics.

Palo Alto.

B. C. E. and B. S., University of Wisconsin, 1883; M. S., 1885; C. E., 1887. Morgan Fellow in Mathematics, Harvard University, 1884-85; Instructor in Engineering, University of Wisconsin, 1885-89, Assistant Professor of Mechanics, 1889-91, Professor of Theoretical and Applied Mechanics, 1891-92.

*JOSEPH SHILLINGTON OYSTER, Professor of Military Science and Tactics. *5 Lasuen Ave.*

Graduate United States Military Academy, West Point, 1874. Second Lieutenant, 1st Artillery, 1874; First Lieutenant, 1880.

ROBERT EDGAR ALLARDICE, Professor of Mathematics. *33 Alvarado Row.*

A. M., University of Edinburgh, 1882. Baxter Scholar in Mathematics, University of Edinburgh, 1882-83, Drummond Scholar in Mathematics, 1883-84; Assistant Professor of Mathematics, University of Edinburgh, 1883-92.

AMOS GRISWOLD WARNER, Professor of Economics and Social Science. *Palo Alto.*

B. L., University of Nebraska, 1885; Ph. D., Johns Hopkins University, 1888. General Agent, Charity Organization Society, Baltimore, 1887-89; Professor of Political Economy, University of Nebraska, 1889-91; Superintendent of Charities, Washington, D. C., 1891-93.

WILLIAM RUSSELL DUDLEY, Professor of Botany. *Lauro Hall.*

B. S., Cornell University, 1874; M. S., 1876. Student, Summer School, Penikese, 1874, Harvard University, 1876, Universities of Strassburg and Berlin, 1887-88. Instructor in Botany, Cornell University, 1872-76, Assistant Professor, 1876-92.

AUGUSTUS TABER MURRAY, Professor of Greek. *Palo Alto.*

A. B., Haverford College, 1885; Ph. D., Johns Hopkins University, 1890. Fellow in Johns Hopkins University, 1887-88; Professor of Greek, Earlham College, 1888-90; Student, Universities of Leipsic and Berlin, 1890-91; Professor of Greek, Colorado College, 1891-92.

ALBERT PRUDEN CARMAN, Professor of Theoretical Physics. *33 Alvarado Row.*

A. B., College of New Jersey, Princeton, 1883; A. M. and D. Sc., 1886. Fellow in Experimental Science, Princeton, 1883-84, Acting Instructor in Physics, 1884-85, Tutor in Mathematics, 1885-87; Student, University of Berlin, 1887-89; Professor of Physics and Applied Electricity, Purdue University, 1889-92.

JULIUS GOEBEL, Professor of Germanic Literature and Philology. *Menlo Park.*

Ph. D., University of Tübingen, 1882. Student, University of Leipzig, 1879-81; Instructor in German, Johns Hopkins University, 1885-88; Editor *Belletristisches Journal*, 1888-92.

EDWARD ALSWORTH ROSS, Professor of Economic Theory and Finance. *24 Alvarado Row.*

A. B., Coe College, 1886: Ph. D., Johns Hopkins University, 1891. Student, University of Berlin, 1888-89; Professor of Economics and Social Science, Indiana University, 1891-92; Associate Professor of Political Economy and Finance, Cornell University, 1892-93.

NATHAN ABBOTT, Professor of Law.

A. B., Yale University, 1876; LL. B., Boston University, 1880. Professor of Law, University of Michigan, 1891-92; Professor of Law, Northwestern University, 1892-94.

*Resigned December, 1893.

FREDERICK A. C. PERRINE, Professor of Electrical Engineering.

Palo Alto.

A. B., College of New Jersey, Princeton, 1883; A. M., 1886; D. Sc., 1885. Assistant Electrician, U. S. Electric Lighting Co., Newark, N. J., 1885-88; Manager Insulated Wire Dept., John A. Roebling's Sons Co., Trenton, N. J., 1888-92; Treasurer, Germania Electric Co., Boston, Mass., 1892-93.

JOHN ERNST MATZKE, Professor of the Romanic Languages.

2 Portola Ave.

A. B., Hope College, 1882; Ph. D., Johns Hopkins University, 1888. Professor of French, Bowdoin College, 1889-90; Professor of the Romance Languages, Indiana University, 1890-91; Associate in the Romance Languages, Johns Hopkins University, 1891-93.

CHARLES NEWTON LITTLE, Professor of Mathematics.

16 Alvarado Row.

A. B., University of Nebraska, 1879; Ph. D., Yale University, 1885. Instructor in Mathematics and Civil Engineering, University of Nebraska, 1880-84, Associate Professor of Civil Engineering, 1885-90, Professor of Civil Engineering, 1890-93.

GEORGE MANN RICHARDSON, Associate Professor of Organic Chemistry. *18 Alvarado Row.*

A. C., Lehigh University, 1886; Ph. D., Johns Hopkins University, 1890. Instructor in Quantitative Chemical Analysis, Lehigh University, 1888-89; Fellow in Chemistry, Johns Hopkins University, 1889-90; Instructor in Organic Chemistry, Lehigh University, 1890-91.

JAMES OWEN GRIFFIN, Associate Professor of German.

32 Alvarado Row.

Graduate of the Pennsylvania State Normal School, 1873; Teacher in Pennsylvania State Normal School, 1873-74; Principal, Unadilla (N. Y.) Academy, 1874-70; Student, University of Göttingen, 1879-80; Principal of Delaware Academy (Delhi, N. Y.), 1880-85; Instructor in German, Cornell University, 1885-91, Registrar, 1890-91.

EDWARD HOWARD GRIGGS, Associate Professor of Ethics.

Palo Alto.

A. B., Indiana University, 1889; A. M., 1890. Instructor in English Literature, Indiana University, 1889-91, Professor of General Literature, 1892-93.

WALTER MILLER, Associate Professor of Latin and Archæology.

College Terrace.

A. M., University of Michigan, 1884. Student, University of Leipzig, 1884-85, 1889-91; Member of the American School of Classical Studies at Athens, 1885-86; Instructor in Greek, University of Michigan, 1886-87, Instructor in Latin and Sanskrit, 1887-88, Acting Assistant Professor, 1888-89; Senior, Royal Archæological Seminary, University of Leipzig, 1890-91; Associate Professor of Greek, University of Missouri, 1891-92.

ARLEY BARTHLOW SHOW, Associate Professor of European History. *Palo Alto.*

A. B., Doane College, 1882; B. D., Andover Theological Seminary, 1885; A. M., Doane College, 1892. Pastor Congregational Church, Waco, Neb., 1885-87; Professor of History and English Literature, Doane College, 1887-92.

WILLIAM HENRY HUDSON, Associate Professor of English.

22 Alvarado Row.

Assistant, Library of Sion College, London, 1885-86; Librarian, City Liberal Club, London, 1889-90; Cataloguer, President White Library, Cornell University, 1890-91; Assistant Librarian, Cornell University, 1891-92.

RUFUS LOT GREEN, Associate Professor of Mathematics.

3 Salvatierra St.

B. S., Indiana University, 1885; A. M., 1890. Instructor in Mathematics, Indiana University, 1885-86; Student, Johns Hopkins University, 1886-87; Professor of Pure Mathematics, Indiana University, 1887-93.

ORRIN LESLIE ELLIOTT, Secretary and Registrar.

24 Alvarado Row.

Ph. B., Cornell University, 1885; Ph. D., 1890. Fellow in History and Political Science, Cornell University, 1885-86, Instructor in English, 1886-91, Assistant Registrar and President's Secretary, 1890-91.

WILLIAM JOSEPH HUSSEY, Associate Professor of Astronomy.

20 Alvarado Row.

B. S., University of Michigan, 1889. Assistant in the Nautical Almanac Office, Washington, D. C., 1889; Instructor in Mathematics, University of Michigan, 1889-91, Instructor in Astronomy and Acting Director of the Observatory, 1891-92.

*VERNON LYMAN KELLOGG, Associate Professor of Entomology.

B. S., University of Kansas, 1889; M. S., 1892. Instructor in Botany and Zoology, University of Kansas, 1888-89; Assistant Professor of Entomology, 1890-93.

HENRY RUSHTON FAIRCLOUGH, Associate Professor of Greek and Latin. *6 Salvatierra St.*

A. B., University of Toronto, 1883; A. M., 1886. Fellow in Classics, University College, Toronto, 1883-84; Classical and English Master, Brockville High School, 1884-86; Graduate Scholar, Johns Hopkins University, 1886-87, Fellow, 1887; Lecturer in Greek and Ancient History, University College, Toronto, 1887-93; Classical Examiner in University of Toronto and Trinity University.

BOLTON COIT BROWN, Associate Professor of Drawing and Painting. *College Terrace.*

B. P., Syracuse University, 1885; M. P., 1889. Instructor in Freehand Drawing, Cornell University, 1885-88; Principal, Fine Art Department, Government Art School, and Parkdale Art School, Toronto, 1889-90; Instructor in Art, Buchtel College, 1890-91.

JAMES PERRIN SMITH, Associate Professor of Mineralogy and Paleontology. *5 Salvatierra St.*

A. M., Vanderbilt University, 1886; Ph. D., University of Göttingen, 1892. Assistant Geologist and Chemist, Arkansas Geological Survey, 1887-90.

MARY SHELDON BARNES, Assistant Professor of History.

12 Alvarado Row.

A. B., University of Michigan, 1874. Teacher of Greek, Latin, and History, Oswego (N. Y.) Normal School, 1875-76; Professor of History, Wellesley College, 1877-79.

---

*Beginning September, 1894.

*EMORY EVANS SMITH, Assistant Professor of Horticulture.

Palo Alto.

Editor California *Florist and Gardener*, 1888-89; Associate Editor *Pacific Rural Press*, 1889; Editor California *Fruit Grower*, 1890-92; Secretary California State Floral Society, 1888-93; President Florists' Club of California, since 1891.

SAMUEL JACQUES BRUN, Assistant Professor of French.

San Jose.

B.-ès-S., Montpelier, France, 1876. French Master, Ackworth School, England, 1879-80; Instructor in French, Haverford College, 1881-82; Instructor in French, Cornell University, 1882-86.

ALPHONSO GERALD NEWCOMER, Assistant Professor of English.

Palo Alto.

A. B., University of Michigan, 1887; A. M., Cornell University, 1888. Instructor in Latin and French, Knox College, 1889-91.

HENRY BURROWES LATHROP, Assistant Professor of English.

College Terrace.

A. B., Harvard University, 1889. Assistant Professor of English, Hobart College, 1889-90; Instructor in English, Harvard University, 1890-92.

†FREDERICK CONVERSE CLARK, Assistant Professor of Economics.

A. B., University of Michigan, 1887; A. M., 1888; Ph. D., 1891. Teacher of History and Economics, Ann Arbor High School, 1888-92.

LIONEL REMOND LENOX, Assistant Professor of Chemistry.

Castro.

Ph. B., Columbia College, 1888. Assistant Chemist, Bethlehem Iron Co., 1887; Instructor in Chemistry, Lehigh University, 1888-91; Chemist, Ordnance Department, U. S. N., Washington, D. C., 1891-92.

JOHN ANTHONY MILLER, Assistant Professor of Mathematics.

14 Alvarado Row.

A. B., Indiana University, 1890; A. M., Leland Stanford Jr. University, 1893. Superintendent of Schools, Rockville, Ind., 1890-91.

DAVID ELLSWORTH SPENCER, Assistant Professor of History.

Palo Alto.

B. L., University of Wisconsin, 1887; A. M., Harvard University, 1891. Student in Law, University of Wisconsin, 1887-88, Instructor in Rhetoric, 1888-89, Instructor in History, 1889-90; Assistant in History, Harvard University, 1891-92; Acting Assistant Professor of History, University of Michigan, 1892-93.

ARTHUR BRIDGMAN CLARK, Assistant Professor of Drawing and Architectural Draughting. *College Terrace.*

B. Ar., Syracuse University, 1888; M. Ar., 1891. Director of Trades Schools and Instructor in Drawing, New York State Reformatory, Elmira, N. Y., 1888-89; Instructor in Architecture, Syracuse University, 1889-92.

---

* Absent on leave, 1893-94.
† Resigned November, 1893.

FRANK MACE McFARLAND, Assistant Professor of Histology.

Palo Alto.

Ph. B., De Pauw University, 1889; A. M., Leland Stanford Jr. University, 1893. Assistant in Biology, DePauw University, 1888–89; Professor of Biology, Olivet College, 1889–92.

MARGARET M. WICKHAM, Assistant Professor of German.

3 Lasuen Ave.

A. B., Vassar College, 1886. Teacher of Latin and German, Cascadilla School (Ithaca, N. Y.), 1886-88; Student in German, Hanover and Berlin, 1888-89, University of Leipzig, 1889-90; Instructor in German, Cleveland College for Women, 1890-91, Associate Professor, 1891-92.

*WILLIAM STUART SYMINGTON, Jr., Assistant Professor of Romanic Languages.

A. B., Johns Hopkins University, 1891. University Scholar, Johns Hopkins University, 1891-92, Graduate Student and Assistant in French, 1892-94.

*MARY ROBERTS SMITH, Assistant Professor of Social Science.

Palo Alto.

Ph. B., Cornell University, 1880; M. S., 1882. Teacher of History, Washington, D. C., High School, 1882-84; Teacher of History, Private School, Cincinnati, O., 1884-86; Instructor in History and Economics, Wellesley College, 1886-90, Registrar and Secretary of Board of Examiners, 1889-90.

MERRITT EUGENE TAYLOR, Assistant Professor of Physics.

Lauro Hall.

B. S., Northwestern University, 1883; M. S., 1884. Assistant in Chemistry, Northwestern University, 1883-84, Instructor in Mathematics, 1884-86; Student at Universities of Berlin, Zürich, and Johns Hopkins, 1886-89; Electrician, Incandescent Lamp Co., Chicago, 1889-92.

GEORGE CLINTON PRICE, Assistant Professor of Zoology.

Palo Alto.

B. S., De Pauw University, 1890. Student in Biology, Johns Hopkins University, 1890-92.

JOHN CHARLES LOUNSBURY FISH, Assistant Professor of Civil Engineering. *Encina Hall.*

C. E., Cornell University, 1892. Instructor in Civil Engineering, Cornell University, 1892-93.

†ELSA LOVINA AMES, Instructor in Drawing.

Palo Alto.

Student, College of Fine Arts, Syracuse University, 1888-91.

CHARLES ELLWOOD COX, Instructor in Mathematics.

College Park.

A. B., Haverford College, 1880; A. M., Leland Stanford Jr. University, 1893. Principal of Friends Academy, Le Grand, Iowa, 1880-85; Professor of Mathematics, University of the Pacific, 1886-91.

---

*Beginning September, 1894.
†Resigned, December, 1893.

HERMAN DE CLERCQ STEARNS, Instructor in Physics.
11 Salvatierra St.

A. B., Leland Stanford Jr. University, 1892; A. M., 1893.

DANIEL WILLIAM MURPHY, Instructor in Physics.
16 Alvarado Row.

A. B., Leland Stanford Jr. University, 1892; A. M., 1893.

CHARLES WILSON GREENE, Instructor in Physiology.
11 Salvatierra St.

A. B., Leland Stanford Jr. University, 1892; A. M., 1893.

WILBUR WILSON THOBURN, Instructor in Zoology, and Acting Curator of the Zoological Museum. *Palo Alto.*

A. B., Allegheny College, 1881; A. M., 1884; Ph. D., 1888. Teacher of Natural Science, Pennsylvania State Normal School, 1881-84; Professor of Geology and Botany, Illinois Wesleyan University, 1884-88; Professor of Geology and Biology, University of the Pacific, 1888-91.

MARGARET E. SCHALLENBERGER, Instructor in Education.
6 Salvatierra St.

Graduate California State Normal School, San Jose, 1880. Teacher in State Normal School, San Jose, 1887-92, Principal of Training Department, 1892-93.

MARY STEVENS AYRES, Instructor in Physical Training.
10 Alvarado Row.

Teacher of Gymnastics, Cazenovia (N. Y.) Seminary, 1883-85; Student, Wellesley College, 1887-92, Harvard University Summer School, 1893.

WALTER ROBERT SHAW, Instructor in Botany.
11 Salvatierra St.

A. B., Leland Stanford Jr. University, 1892.

STEWART WOODFORD YOUNG, Instructor in Chemistry.
Palo Alto.

B. S., Cornell University, 1890. Assistant in Chemistry, Cornell University, 1890-91; Instructor in Chemistry, Swarthmore College, 1891-93.

CLELIA DUEL MOSHER, Instructor in Hygiene and Physical Training. *Palo Alto.*

A. B., Leland Stanford Jr. University, 1893.

LOUIS ALEXANDER BUCHANAN, Foreman of the Wood-working Shop. *3 Salvatierra St.*

M. E., Leland Stanford Jr. University, 1893. Instructor in Mechanical Drawing and Mathematics, Polytechnic Evening School, St. Louis, 1882-88; Draughtsman for the St. Louis Water Works Construction, 1887-89; Foreman of Construction, N. O. Nelson Manufacturing Co., 1890-91.

ASSISTANTS.

GEORGE ARCHIBALD CLARK, President's Secretary, and Teacher of Shorthand. *Palo Alto.*

B. L., University of Minnesota, 1891.

WILLIS GRANT JOHNSON, Assistant Registrar.
11 Salvatierra St.

A. B., Leland Stanford Jr. University, 1892. Assistant in Entomology, Leland Stanford Jr. University, 1892-93.

ANNA LOUISA BROWN, Artist of the Hopkins Laboratory.
24 Alvarado Row.

B. P., Syracuse University, 1889.

CLARK WILSON HETHERINGTON, Assistant in Physical Training.
11 Salvatierra St.

HENRY COFFINBERRY MYERS, Assistant in Chemistry.
Mariposa Hall.

Ph. D., Strassburg, 1891; F. C. S., London, 1891. Consulting Chemist, Haskin Wood Vulcanizing Co., New York, 1892-93.

CAMILLO OLIVETTI, Assistant in Electrical Engineering.
Palo Alto.

C. E., University of Turin, 1891.

LOUIS CRAIG CORNISH, Assistant in Ethics. *Palo Alto.*

KATHRYNE JANETTE SMITH, Assistant in English. *San Jose.*

Ph. B., University of the Pacific, 1888.

JESSICA S. VANCE, Assistant in English. *San Jose.*

Ph. B., University of the Pacific, 1884.

GENEVRA SISSON, Assistant in Education, in charge of the Kindergarten. *6 Salvatierra St.*

JULIUS EMBRET PETERSON, Foreman of the Forge.
College Terrace.

JOHN KINLAY WIGHT, Curator of the Art Museum. *Mayfield.*

A. B., Leland Stanford Jr. University, 1893.

EDWIN CHAPIN EWELL, Library Assistant. *Mayfield.*

FREDERICK JOHN TEGGART, Library Assistant. *Encina Hall.*

BENJAMIN OLIVER FOSTER, Library Assistant. *Mariposa Hall.*

LECTURERS.

FREDERICK LOUIS OTTO ROEHRIG, Lecturer on Oriental Philology. *San Francisco.*

Ph. D., Leipzig; M. D., Paris. Assistant Professor of French, and Professor of Sanskrit and Modern Oriental Languages, Cornell University, 1869-86.

BARTON WARREN EVERMANN, Assistant in Special Investigations, Hopkins Laboratory. *Washington, D. C.*

B. S., Indiana University, 1886; A. M., 1888; Ph. D., 1891. Professor of Biology, Indiana State Normal School, 1886-91; Assistant, U. S. Fish Commission, in charge of Explorations of Rivers and Lakes, since 1891.

*WESTEL WOODBURY WILLOUGHBY, Lecturer on Politics. *Washington, D. C.*

A. B., Johns Hopkins University, 1888; Ph. D., 1891. Fellow in History and Politics, Johns Hopkins University, 1890-91; Attorney-at-Law, Washington, D. C., since 1892.

OTHER OFFICERS.

ELLEN FRANCES THOMPSON, Mistress of Roble Hall. *1 Roble Hall.*

CHARLES EDWARD HODGES, Resident Architect. *22 Alvarado Row.*

ROBERT HENRY MOORE, Chief Engineer. *Palo Alto.*

JOHN J. LEWIN, Electrician. *Palo Alto.*

GEORGE ADDERSON, Overseer of Buildings. *Encina Hall.*

CHARLES F. MOORE, University Plumber. *Menlo Park.*

CHARLES C. WALLEY, University Carpenter. *Mayfield.*

WILLIAM NORRIS NESBIT, Forester. *Palo Alto.*

STANDING COMMITTEES.

Ways and Means:—Professors STILLMAN, HOWARD, BRANNER, WARNER, and A. W. SMITH.

Students' Affairs:—Professors MARX, GRIFFIN, and MURRAY.

Admission of Students:—Professors A. W. SMITH, MURRAY, E. BARNES, and the REGISTRAR.

Doubtful Cases:—Professors RICHARDSON, LITTLE, and MARX.

*In 1894–95.

Entrance Requirements:—Professors SANFORD, PEASE, ANDERSON, GILBERT, and GREEN.

Petitions:—Professors WING, HUSSEY, and FAIRCLOUGH.

Intercollegiate Affairs:—Professors BRANNER, STILLMAN, and WARNER.

Chapel Exercises:—Professors GRIFFIN, W. MILLER, and SHOW.

Receptions:—Professors ALLARDICE, OYSTER, GOEBEL, CAMPBELL, and PERRINE.

Publications:—Professors HOWARD, DUDLEY, WOODRUFF, FLÜGEL, and GOEBEL.

Graduation:—Professors PEASE, MATZKE, STILLMAN, HOSKINS, and the REGISTRAR.

University Extension:—Professors ROSS, E. BARNES, and WOOD.

Summer School:—Professors GREEN, GRIGGS, and W. MILLER.

Public Exercises:—Professors WOODRUFF, A. W. SMITH, and HUDSON.

Resolutions:—Professors ANDERSON, ALLARDICE, and PERRINE.

Athletics:—Professors ANGELL, WOOD, and RICHARDSON.

Midwinter Fair:—Professors E. BARNES, CARMAN, and BRANNER.

Hopkins Laboratory:—Professors JENKINS, GILBERT, DUDLEY, and CAMPBELL.

Organization and Administration.

FOUNDATION.

The founding at Palo Alto of "a university for both sexes, with the colleges, schools, seminaries of learning, mechanical institutes, museums, galleries of art, and all other things necessary and appropriate to a university of high degree," was determined upon by the Hon. Leland Stanford and Jane Lathrop Stanford, in 1884. In March of the year following the legislature of California passed an Act providing for the administration of trust funds in connection with institutions of learning. November 14, 1885, the Grant of Endowment was publicly made, in accordance with this Act, and on the same day, the Board of Trustees held its first meeting, in San Francisco. The work of construction was at once begun, and the corner-stone laid May 14, 1887, the nineteenth anniversary of the birth of Leland Stanford, Jr. The University was formally opened to students October 1, 1891.

NAME AND PURPOSE.

The idea of the University, in the words of its founders, "came directly and largely from our son and only child Leland; and in the belief that had he been spared to advise as to the disposition of our estate, he would have desired the devotion of a large portion thereof to this purpose, we will that for all time to come the institution hereby founded shall bear his name, and shall be known as The Leland Stanford Junior University."

The object of the University, as stated in its Charter, is "to qualify students for personal success and direct usefulness in life," and its purposes, "to promote the public welfare by exercising an influence in behalf of humanity and civilization, teach-

ing the blessings of liberty regulated by law, and inculcating love and reverence for the great principles of government as derived from the inalienable rights of man to life, liberty, and the pursuit of happiness."

LOCATION.

The University is located on the Palo Alto estate in the Santa Clara Valley, thirty-three miles southeast of San Francisco, on the Coast Division of the Southern Pacific Railway. The estate consists of eight thousand four hundred acres, partly lowland and partly rising into the foothills of the Sierra Morena. On the grounds are the residence of the founders and an extensive arboretum containing a great variety of shrubs and trees. The Bay of San Francisco lies about three miles east of the University buildings, and across the bay the Monte Diablo Range rises to the height of over four thousand feet. The Lick Observatory, crowning Mt. Hamilton, the highest of the range, is plainly visible. To the southwest, between the valley and the ocean, is the heavily wooded Santa Cruz Range, two thousand to four thousand feet in height.

The Santa Clara Valley is one of the most attractive portions of the state in climate, in natural beauty, and in the fertility and adaptiveness of its soil to all the varied fruits of California. The characteristics of the climate are its evenness of temperature, its pure and bracing air, and its freedom alike from the fogs and harsh winds of the coast and from the oppressive summer heat of the interior valleys. In winter the mercury rarely falls below 30°, and the average midday temperature is about 55°; in summer the average midday temperature is between 75° and 80°, while the nights are always cool. The rainfall of about twenty inches is chiefly confined to the months from December to April inclusive.

ENDOWMENT.

The property conveyed to the University, in addition to the Palo Alto estate, consists of the Vina Estate, in Tehama Coun-

ty, of fifty-nine thousand acres, of which about four thousand acres are planted in vines, and the Gridley Estate, in Butte County, of twenty-two thousand acres, devoted mainly to the raising of wheat. By the will of Mr. Stanford the University receives two and a half million dollars, but this bequest is not yet available.

BUILDINGS.

In arranging the buildings and grounds the plan has been to conform them to the peculiar climatic conditions of California, and to provide for indefinite expansion, without crowding or distortion. A series of quadrangles, to be erected as the needs of the University demand, will furnish facilities for all general University work. Surrounding these will be various detached buildings for miscellaneous purposes, and the University town, with carefully laid out streets and grounds.

The central group of buildings will constitute two quadrangles, one entirely surrounding the other. Of these the inner quadrangle, with the exception of the chapel, is now completed. Its twelve one-story buildings are connected by a continuous open arcade, facing a paved court five hundred and eighty-six feet long by two hundred and forty-six feet wide, or three and a quarter acres. The buildings are of a buff sandstone, somewhat varied in color. The stonework is of broken ashlar with rough rock face, and the roofs are covered with red tile. The architectural *motif* is to be found in the old Spanish Missions of California.

The grounds to the east and west of the central quadrangles have been reserved for six smaller quadrangles, three on either side. Behind the central quadrangles will be the workshops of the mechanical engineering department, the boiler and power houses, and the mechanical laboratories—of which the shops, foundry, and boiler house are now completed.

The dormitories are east and west of the quadrangle. *Encina Hall*, for young men, is at the east and occupies a ground area of 312 x 150 feet. It is provided with electric lights, hot and

cold water, steam heat, suitable furniture, bath rooms on each floor, and has accomodations for 315 students. Four stories high, built of the same material as the quadrangle, and decorated with end arcades, a central arched porch, and mosaic work, it forms the terminus of what will be the grand facade of the University, two-thirds of a mile long. *Roble Hall*, for young women, is at the west. It is of concrete, is about a third the size of Encina Hall, and will accommodate 100 students.

The Leland Stanford Junior Museum, a concrete building, 313 x 156 feet, including wings, is situated a quarter of a mile from the quadrangle, and on the west side of the Palo Alto avenue. At the main entrance, four large columns form the principal feature of the facade. The vestibule is 45 x 56 feet, and 70 feet high, and is faced with marble. The building is surmounted by statues of Plato, Herodotus, Aristotle, and Plutarch. The Museum contains the archæological and art collections of the University.

Encina and Roble Gymnasiums are substantial frame buildings, equipped with the necessary apparatus and appliances for physical training.

LIBRARY.

One building of the quadrangle is at present devoted exclusively to the library. It has a shelving capacity of thirty-five thousand volumes, and the reading-room will accommodate one hundred and twenty-five students.

The library now numbers nineteen thousand volumes and five thousand six hundred pamphlets. The most notable gift to the library has been the valuable collection of railway books presented by Mr. Timothy Hopkins, of San Francisco. This special collection is unusually rich in materials for the study of the early history of railways in Europe and America, and the donor has made generous provision for the maintenance and increase of the collection until it shall be practically complete. Mr. Hopkins has also given $4000 for the purchase of biological works during 1893-94.

In addition to the University library, various large collections in San Francisco can be made available to a greater or less extent. The Mechanics' Institute and Mercantile are subscription libraries, and the Public, a circulating library to residents of the city, can be used for reference. The Sutro Library, founded by Mr. Adolph Sutro, and containing about two hundred and fifty thousand volumes, chosen with particular reference to the needs of investigators, is accessible to graduate students and students engaged in special lines of investigation. It is especially rich in mediæval publications and in books and pamphlets illustrative of the history of Europe. There are also at the University several large private libraries to which advanced students have access.

SCIENTIFIC COLLECTIONS.

It is intended to bring together in the museums of the University a full representation of the natural history and mineral products of California, collections of all books, pamphlets, photographs, and maps bearing upon the early history of the West, and full collections of Indian antiquities and illustrations of aboriginal life. It is desired to receive donations from all persons who are interested in the work and who have material of value to the museums. All collections sent in this way will be carefully labelled and preserved, and the name of the donor will be kept on record. Messrs. Wells, Fargo & Co. generously offer to transport such gifts to the University free of charge, and have instructed their officials "to receive and promptly forward such offerings as may be tendered from time to time."

TRUSTEES.

The general management and control of the institution is vested in a board of twenty-four trustees, chosen for life, of whom fifteen constitute a quorum. The charter provides that the Founders, during their lives, shall "perform all the duties and exercise all the powers and privileges enjoined upon and vested in the trustees."

FACULTY AND COUNCIL.

The Faculty consists of the President, professors, associate professors, assistant professors, and instructors, aided by non-resident lecturers, assistants, and other officers. Its routine work is divided among the following committees: on Ways and Means; on Entrance Requirements; on Admission of Students; on Students' Affairs; on 'Doubtful Cases'; on Petitions; on Graduation; on Publications; on Chapel Exercises; on Receptions; on Public Exercises; on Resolutions; on Athletics; on Summer School; on the Hopkins Laboratory; on University Extension; on Intercollegiate Affairs.

The University Council consists of the President, professors, including the librarian, and associate professors. To the Council are entrusted the determination of requirements for admission, and for the various degrees; the recommendation of candidates for graduation; and the selection of Fellows. It also acts as an advisory body on any questions of general policy that may be submitted to it by the President or Trustees.

GOVERNMENT OF THE STUDENTS.

In the government of the University the largest liberty consistent with good work and good order will be given to the students. The University is not a reform school; its bounty is intended for the earnest and industrious student, and the indolent or unworthy will not be retained in the institution.

RELIGIOUS SERVICES.

Religious instruction is given in accordance with the provision of the Charter which prohibits sectarian instruction, but requires the teaching of the "immortality of the soul, the existence of an all-wise and benevolent Creator, and that obedience to His laws is the highest duty of man." Voluntary chapel exercises are held daily, and a sermon or address on some religious or ethical subject is given every Sunday morning by some

clergyman or layman invited from abroad, or by some member of the Faculty.

A Students' Christian Association, A Young Men's Christian Association, and a Young Women's Christian Association have been organized. Regular meetings are held, and systematic courses of Bible Study carried on. The Christian Associations have compiled a *Hand-Book* containing special information relating to the details of University life at Palo Alto, including library regulations, registration rules, boarding places, etc. This hand-book will be mailed to prospective students on application to the Registrar.

STUDENT ORGANIZATIONS.

In addition to the Christian Associations noted above, numerous general student organizations have been formed for mutual assistance and improvement in various lines.

DEPARTMENTS.

The following Departments have been established: Greek; Latin; Archæology; Germanic Languages; Romanic Languages; English Language and Literature; Psychology; Ethics; Education; History; Economics and Social Science; Law; Mathematics; Astronomy; Physics; Chemistry; Botany; Entomology; Horticulture; Physiology; Physical Training; Zoology; Geology; Drawing and Painting; Mining Engineering; Civil Engineering; Mechanical Engineering; Electrical Engineering; Military Science and Tactics.

The Hopkins Laboratory of Natural History, located at Pacific Grove, on the Bay of Monterey, is a branch of the biological work of the University.

Admission and Graduation.

CONDITIONS OF ADMISSION.

Candidates for admission must be at least *sixteen* years of age, or if special students, *twenty*. They must present certificates of good moral character, and if from other colleges or universities, must bring letters of honorable dismissal.

I. ADMISSION ON EXAMINATION.

For meeting the entrance requirements of the University candidates are offered a choice of twenty-two subjects. These subjects are all reduced to the unit of a high school year, making twenty-eight credits, and placed on an exact equality, except that subject 1 (English) is required of all applicants. *Twelve* credits are necessary for admission to full standing, and these may be made up of English (2 credits) and such other subjects (aggregating 10 credits) as may be selected by the candidate. [In 1894 *eleven* credits will be accepted for admission to full standing.]

1. English (2).
2. Elementary Algebra (2).
3. Plane Geometry.
4. Solid Geometry (½).
5. Trigonometry (½).
6. Advanced Algebra.
7. Physics.
8. Chemistry.
9. Physiology.
10. Botany.
11. Zoology.
12. Drawing.
13. American History.
14. English History.
15. Grecian and Roman History.
16. English Literature.
17. Spanish.
18. French (2).
19. German (2).
20. Elementary Latin (2).
21. Advanced Latin (2).
22. Greek (2).

Solid Geometry and Trigonometry together count one credit; English, Elementary Algebra, French, German, Elementary Latin, Advanced Latin, and Greek, two credits each; all others, one credit each.

The following will indicate the amount of preparation necessary in the various subjects. Full equivalents of the specific work outlined will be accepted in all subjects. The High School year here assumed is based roughly on an average of four recitation exercises of three-quarters of an hour each, per week, in each subject.

1. **English.—a.** *Poetry and the Drama:* Shakspere's Merchant of Venice and Julius Cæsar; Scott's Lady of the Lake; Whittier's Snow-Bound; Longfellow's Evangeline. *Prose:* Irving's Sketch-Book; Thackeray's Newcomes; the Sir Roger de Coverly Papers from the Spectator; Scott's Quentin Durward; Macaulay's Essay on Addison; Macaulay's Life of Johnson.

[Substantial equivalents, such as the books prescribed by the University of California or by Harvard University, will be accepted instead of any or all of the books in this list.]

b. Every applicant will also be required to undergo a test of his ability to write exercises correct in spelling, punctuation, sentence-structure, and paragraphing. He may be called upon, for instance, to write a business letter upon some assigned subject, to put into his own language an essay, the material of which is provided him, or to write from dictation; or his examination papers in other subjects may be submitted to the examiner in English; in short, he may be subjected to any fair test of his mastery of the English language for the practical purposes of life. (The equiv alent of two years in the High School.)

[Students who are conditioned in English 1 *b* will be given an opportunity to make up their deficiency in voluntary classes under private instructors approved by the University. These instructors will charge a fee not exceeding ten dollars a semester.]

2. **Elementary Algebra.**—Fundamental operations, factors, highest common factor, lowest common multiple, fractions, equations of first degree, fractional and negative exponents, surds, equations of the second degree in one or more variables, ratio and proportion, the progressions. Charles Smith's Elementary Algebra, or Wentworth's School Algebra, or an equivalent. (The equivalent of one and a half years in the High School.)

3. **Plane Geometry.**—A complete course in Plane Geometry such as is contained in Chauvenet's Geometry. (The equivalent of one year in the High School.)

4. **Solid Geometry.**—A complete course in Solid Geometry such as is contained in Chauvenet's Solid Geometry. (The equivalent of one-half year in the High School.)

5. **Trigonometry.**—An elementary course in Plane Trigonometry such as is contained in Wells' Plane Trigonometry or in Lock's Elementary Trigonometry. (The equivalent of one-half year in the High School.)

6. **Advanced Algebra.** — Combinations and permutations, convergence of series, binomial theorem, logarithms, exponential and logarithmic series, partial fractions, and a short treatment of determinants. Chapters i–xxiv and xxxi of Charles Smith's Treatise on Algebra, or an equivalent. (The equivalent of one year in the High School, in addition to the elementary course in Algebra.)

7. **Physics.** — The equivalent of a year's work in experimental Physics. This should cover the amount of laboratory practice outlined in such a manual as Allen's Laboratory Physics, Hall & Bergen's Physics, Shaw's Physics by Experiment, Gage's Laboratory Manual, or Chute's Physics. It is preferred that the study begin by the experimental method and that recitations from a text should follow, rather than precede the working out of the experiments by the pupils. Candidates for entrance credit in this subject should present their laboratory note books with their application.

8. **Chemistry.** — Beside the usual text-book and recitation work, each student should have a course in the laboratory, where he performs the experiments for himself. The amount of laboratory work desired cannot be obtained with less than four hours' per week for one school year spent in actual laboratory work. It is preferred that the laboratory work be entirely upon *general*, rather than partly upon *analytical* chemistry. The course required is comprised in Remsen's Introduction to the Study of Chemistry. The inorganic portion of Roscoe's Elementary Chemistry, or of Elliot and Storer's Elementary Chemistry, with a proper course of laboratory experiments such as is given in William's Manual, or in Smith and Keller's Laboratory Manual, are also recommended as covering the course required.

It is the purpose of the Department of Chemistry to admit those who receive credit in subject 8 to the second year's work in Chemistry in the University. For this reason any course short of an approximate equivalent of the first year's work in the University will not be acceptable. An inadequate course is of little value either as scientific training, or as chemical knowledge, and it does not seem desirable to give entrance credit for a course which the student must repeat at least in great part before he can go on with the subject.

9. **Physiology.**—The elements of human physiology and hygiene, the equivalent of Martin's Human Body (not the "Briefer Course"). The text-book work should be accompanied by experiment, dissection of animals and organs, and a certain amount of study of the tissues with the microscope. (The equivalent of one year in the High School.)

In placing Physiology in the list of entrance subjects the fact that Physiology is not generally taught in the High School is recognized. Still it is thought that candidates who come from High Schools where the subject is pursued for at least a year, should have the opportunity of presenting the work for entrance to the University. This explanation may make it clear that candidates who have taken only the work in elementary physiology and hygiene done in the grammar or intermediate grades are not prepared to offer the subject as one of the entrance subjects to the University. The elementary physiology and hygiene of the grammar grades, in this regard, is in the same category as are the other subjects studied in the grammar grades, such as arithmetic and geography, which are assumed as preliminary to the subjects offered for entrance.

10. **Botany.** — A knowledge of plants and plant-structure and development obtainable from experimental work in connection with Bessey's or Campbell's Botany, or some similar work. (The equivalent of a full year in the High School, of which two-thirds at least should be laboratory work.)

In stating the requirements for students presenting themselves for examination in botany, the main thing had in mind was that the work should be of a practical nature; that is that the study should be done mainly from specimens and not from books. It must be borne in mind that botany is a department of biology, and means something more than the mere collecting and naming of specimens. A study of the growth and development of the forms studied is of the highest importance, and so far as possible should be made a prominent feature in the work. A good plan for most schools is to select a few typical representatives of the principal groups of plants, e. g., examples of the green, red, and brown algae, moulds, mildews, lichens, liverworts, mosses, ferns, etc., as well as representatives of the great divisions of the flowering plants. Examples of all of these are everywhere accessible, and a knowledge of the main characteristics of each of the principal divisions of plants will be expected of the student. The forms selected are to be studied as exhaustively as circumstances will admit, and students should be expected to keep a careful record of their work in the form of notes and drawings made directly from the specimens as they are studied.

If possible the student should be allowed the use of a compound microscope, but when this is not practicable, microscopic demonstrations

by the instructor are indispensable. The laboratory work of the students may be supplemented by such explanatory and text-book work as may be deemed necessary, but this must be understood to supplement and not to replace the laboratory work.

11. **Zoology.**—A knowledge of the structure and relationships of a number of types of animals, gained by study and dissection of specimens in the laboratory. Marshall and Hurst's Practical Zoology is recommended as a laboratory guide. (The equivalent of a full year in the High School.)

12. **Drawing.**—The ability to make from nature a correct and expressive outline drawing of a landscape, including buildings; or, the ability to make a good and workmanlike light and shade drawing from a group of colored still-life objects; or, the ability to make a reasonably accurate and workmanlike life-size outline of a head from nature; or, the ability to make a good light and shade study of a cast of the head or full figure. (The equivalent of one full year in the High School, or of five hours of University work.)

No student will be credited in Drawing, (1) who cannot draw geometric models in true perspective, (2) who cannot outline clearly and accurately, (3) who cannot shade evenly and truly with some one of these materials: the brush, the pencil, the pen, the charcoal.

13. **American History.**—A thorough knowledge of Sheldon's Studies in American History (Boston 1891), Thwaite's Colonies (Epochs of American History Series, New York and London, 1891), and Macy's Our Government (revised edition, Boston, 1890). These should be studied in connection topically. MacCoun's Historical Geography of the United States will prove a valuable aid; and for further reading, Fiske's Civil Government, the American Statesmen Series, and the American Commonwealth Series are recommended. (The equivalent of one year in the High School, in addition to the ordinary grammar school course.)

14. **History of England.**—The equivalent of Gardiner's Student's History of England (New York and London, 1890), and Fonblanque's How We Are Governed. These may be supplemented by readings in Green's History of the English People and the Epochs of Modern History Series. (The equivalent of one year in the High School.)

15. **Grecian and Roman History.**—The equivalent of Fyffe's History of Greece (History Primers), Allen's Short History of the Roman People (Part II of Allen and Myers' Ancient History, Boston, 1891), and Tighe's Development of the Roman Constitution (History Primers). For

further topical study, read the Epochs of Ancient History Series. (The equivalent of one year in the High School.)

16. English Literature. — Complete familiarity, both as to substance and as to form, is expected, with the contents of the books mentioned below. Preparation should embrace questions of grammar, of metre, and of rhetorical form, and some attention should be given to so much of literary history and biography as naturally connects itself with the works read. Candidates will be tested upon their ability to quote freely and accurately, to paraphrase intelligently, and to outline symmetrically. *Prose: (a)* Burke's Speeches on the American War and Letter to the Sheriffs of Bristol, edited by A. J. George; or *(b)* Genung's Rhetorical Analysis, in connection with some such work as A. S. Hill's Principles of Rhetoric. *Poetry:* Hales's Longer English Poems, omitting Shelley's Adonais. *Word Derivation:* The etymological notes to the selections from Spenser and Milton in Hales's Longer English Poems. The derivations in question should all be carefully verified in Webster's International Dictionary. (The equivalent of one year in the High School.)

Candidates who have done systematic work in other books than those enumerated may be accepted upon sustaining a satisfactory examination.

17. Spanish. — Manning, Practical Spanish Grammar (Henry Holt & Co., New York). Special attention should be paid to the absolute mastery of the inflections and conjugations and the principal parts of verbs. Knapp's Spanish Readings; Valdés, José, novela de costumbres marítimos (Madrid, 1885). (The equivalent of one year in the High School.)

18. French. — Grandgent's Short French Grammar (Heath & Co.), with the written exercises. Special stress should be laid upon the absolute and accurate acquisition of the forms of the language, and especially of the irregular verbs. Systematic training in pronunciation on the basis of Koschwitz, Les Parlers Parisiens (Welter, Paris). Super's French Reader, Parts II and III. Jules Verne, Michel Strogoff (ed. Lewis, Henry Holt & Co., New York). Labiche, Le Voyage de Monsieur Perrichon (Jenkins, New York). Sandeau, Mademoiselle de la Seiglière (ed. Warren, D. C. Heath & Co., Boston). (The equivalent of two years in the High School.)

19. German. — A satisfactory preparation will require: the ability to translate easy German prose and verse at sight; an accurate knowledge of the principles of grammar, embracing especially inflections and syntax, the composition of words, the force of prefixes and suffixes, and the relation of the English and the German consonantal changes; also the ability to translate easy prose from English into German. This preparation

would be represented approximately, in reading, by Brandt's or Whitney's Reader, and the careful study of one or more modern dramas; in grammar, by Brandt's, Joynes-Meissner's, or Whitney's Grammar; and in German prose, by the first twenty-six exercises in Harris' German Prose Composition. (The equivalent of two years in the High School.)

All applicants are expected to present a statement from their former teacher of the amount of German read and the text-books used.

20. **Elementary Latin.**—The requirements for Elementary Latin include accuracy in pronunciation, a thorough knowledge of the forms, familiarity with the simpler principles of syntax, a vocabulary of from 1500 to 2000 common words, and the ability to translate easy prose at sight and to write simple sentences.

These attainments ought to be secured from the careful study of an elementary text-book and about 120 pages of classical prose, together with *daily* exercise in oral or written composition and occasional practice at sight reading. The examinations in Latin Composition for 1894 and 1895 will be based upon the third and fourth books of Cæsar's Gallic War and the first two orations of Cicero against Catiline. Students entering upon certificate will be subjected to a test in writing Latin, except where the department is satisfied that the requirements in this particular have been fully met.

21. **Advanced Latin.**—The requirements for Advanced Latin include the ability to translate at sight the simpler portions of Cicero's orations and Vergil's Æneid, familiarity with the principles of Latin hexameter, and the power to translate a passage of connected English based on Cicero.

These attainments ought to be secured from the careful study of four or five orations of Cicero and six books of Vergil's Æneid, if supplemented by daily exercises in composition in connection with the Cicero, and by extensive practice in sight reading.

22. **Greek.**—Grammar, the inflections, the formation of words, and the essential points of the syntax; Xenophon, Anabasis, books I–IV; Homer, Iliad, books I–II; Prose Composition, ability to write easy connected prose (Collar & Daniel's text-book is recommended); translation at sight of easy prose. (The equivalent of two years in the High School.)

A thorough understanding of the ordinary forms of syntax is expected, and the student should be able to translate into *idiomatic* English. A passage of simple prose is selected for sight-translation, and a brief English passage for translation into Greek. It is expected of every student that he be able to read Greek aloud without stumbling.

Partial Standing.

Candidates may be admitted to partial standing in the University upon securing at least ten entrance credits, if in the judgment of the Faculty they are qualified to go on with regular University work. All deficiences must be made up before a student can be admitted to full standing. [In 1894 *nine* credits will be accepted for admission to partial standing.]

Time of Examination.

Examinations in all entrance subjects are held at the beginning and at the end of the school year. In May these examinations will be held at Palo Alto and simultaneously at other appointed places; in September, at Palo Alto only. No entrance examinations will be held at any other time. Specimen examination papers may be obtained on application to the Registrar.

Entrance examinations are held in the following order. For places and dates, see calendar, page 5.

First Day.—Physiology, 8:30—10:30; Elementary Algebra, 10:30—12:30; Plane Geometry, 1:30—3:30; English, 3:30—6:00.

Second Day.—Advanced Algebra, Spanish, and Physics, 8:30—10:30; German and Greek, 10:30—12:30; Solid Geometry, English History, and French, 1:30—3:30; Elementary Latin, 3:30—6.00.

Third Day.—Advanced Latin, Chemistry, and Botany, 8:30—10:30; Trigonometry and English Literature, 10:30—12:30; American History and Zoology, 1:30 -3:30; Grecian and Roman History and Drawing, 3:30—6:00.

Candidates for admission, may, if they prefer, take a part of their examinations a year before they propose to enter: but no account will be taken of the result of such examinations unless at least four subjects are passed. These four subjects may be divided between the May and September examinations at the option of the candidate.

II. ADMISSION ON CERTIFICATE.

The University does not agree, in advance, to exempt the graduates of any school from all entrance examinations. Recommendations from the principal of any reputable preparatory school will be considered, and examinations waived in all entrance subjects fairly covered in the applicant's course of study, subject to the following conditions:

1. The applicant must have completed a full course in the school and have been duly graduated.

2. The applicant must be specifically recommended by the principal in the subjects in which exemption is granted.

3. The faculty reserve the right to require an examination in any recommended subject, if for any reason the work done is deemed insufficient or unsatisfactory.

4. For the present, certificates will not be accepted in entrance subject 1*b* (English Composition).

5. Since the entrance preparation outlined in history, the natural sciences, and freehand drawing is different, and in general, more than is usually given in the schools, examinations in these subjects are not ordinarily waived, except by special arrangement with the departments concerned.

6. Recommended graduates of the San Jose, Los Angeles, and Chico State Normal Schools, may be admitted, without examination, except in English 1*b*, to provisional undergraduate standing, such standing subject to revision after one year's attendance.

Exemptions from entrance examinations are granted on satisfactory recommendations as a matter of mutual convenience, and to save applicants from unnecessary worry; at the same time it is not considered that the requirement of an examination is necessarily a hardship, and the University will not hesitate to prefer examinations in all cases where there is doubt either as the quantity or quality of the work offered.

Recommendations will be considered at any time of the year, but since, in general, no one can be assured of admission to

the University without examination in one or more subjects, it is important that certificates be forwarded as early as possible during the summer.

Blanks for admission on certificate may be obtained from the Registrar.

III. ADMISSION AS SPECIAL STUDENTS.

Persons at least twenty years of age, who are not candidates for a degree, and who wish to pursue some one study and its related branches, may be admitted as special students, without passing the usual entrance examinations, on the recommendation of the professor under whom the specialty is to be taken. But the professor concerned may impose any test, by examination or otherwise, that he may deem advisable. Candidates are advised to correspond directly with the professor in whose department they desire to work. Blank applications for admission as special students may be obtained from the Registrar.

A failure on the part of any special student to maintain a good standing in the special studies to which he is admitted will at once sever his connection with the University.

IV. ADMISSION TO ADVANCED STANDING.

Students from other institutions of recognized collegiate rank, who present letters of honorable dismissal, may be admitted to such standing and upon such terms as the Faculty may deem equitable. Every such candidate is required to present, along with a catalogue of the institution in which he has studied, a full statement, duly certified, of the studies he has completed, including studies passed or credited at entrance.

Students from other institutions, whose credentials are satisfactory, are usually admitted, without examination, to a minimum standing of one year less than that to which they are entitled at the institution from which they come. At the same time they are admitted to such classes as their preparation seems to warrant. After one semester's residence, if their work

has been thoroughly successful and of sufficiently high grade, the terms of admission may be readjusted, and such additional credit given as may then be deemed just by the Faculty; but no such student can finally be given advanced credit for more than three years' work (ninety hours toward graduation).

V. ADMISSION TO GRADUATE STANDING.

Graduates of this University, and of other institutions of recognized collegiate rank, may be admitted to graduate standing in the University upon presentation of diplomas or equivalent credentials. They may become candidates for advanced degrees upon fulfilling the conditions prescribed by the Faculty. In case they become candidates for baccalaureate degrees, the question of hours required for graduation may be waived and the degrees conferred on the satisfactory completion of the major subject, provided such students average fifteen hours of work per semester while in the University; except that no degree will be conferred until such students have completed at least thirty hours of University work. Graduate students, not candidates for any degree, may be admitted, upon the approval of the major professor, to such work as their previous training seems to warrant.

REGISTRATION.

At the beginning of each semester each student must register in person at the Registrar's office; and no student, having been once admitted to the University, will be allowed to register after the close of Registration Day, except by permission of the Faculty. At the beginning of the collegiate year, students register for the work of the whole year; and no changes can be made except by permission of the Faculty. No credit will be allowed for work not registered, except by special permission of the Faculty; and no petition for such credit will be considered when such permission would give the student more than eighteen hours for the semester. *Fifteen* hours constitute an

average semester's work. Students may register for less than *thirteen* or more than *eighteen* hours only by permission of the Faculty; but no student who has 'failed' in any subject in the semester immediately preceding, or who has any mark of 'condition' standing against him, will be allowed to register for more than *fifteen* hours, except by special vote of the Faculty through the appropriate committee.

Every hour for which credit is given is understood to represent approximately, for the average student, three hours of actual work per week through one semester. Thus, in lecture or recitation work, one hour is allotted to the lecture or recitation and two hours for preparation or subsequent reading and study on the part of the student. Where the time is wholly occupied with drawing, field, or laboratory work, three full hours per week through one semester are expected of the student for each hour that counts toward graduation. Where the drawing, field, or laboratory work is supplemented by systematic outside reading or experiment, under the direction of the instructor, such a reduction may be made in actual drawing, field, or laboratory time, as seems just to the department concerned.

Students who find it necessary to leave before the close of the year, and who expect to return, and students desiring to be absent for one or more semesters, should obtain leave of absence from the Faculty.

GRADUATION.

Candidates may present themselves for graduation at the end of either semester.

FIRST DEGREE.

The Degree of *Bachelor of Arts* (A. B.) will be granted to students who have satisfactorily completed the equivalent of four years' work of fifteen hours of lecture or recitation weekly, or a total of one hundred and twenty hours, and who have also satisfied the requirements in major and minor subjects.

Each student shall select as his major subject or specialty the work of some one professor. This professor shall have the authority to require such student to complete this *major* subject, and also as *minor* subjects such work in other departments as the professor may regard as necessary or desirable collateral work. Such major and minor subjects taken together will not exceed the equivalent of five recitations per week, or one-third of the student's time for the four years of undergraduate work.

With these exceptions, all the undergraduate work in all departments is elective. The student may freely choose for such elective work any subject taught in the University, which his previous studies have prepared him to undertake.

The professor in charge of the major subject of any student is expected to act as adviser to the student in educational matters, and the recommendation of such professor is necessary to graduation.

ADVANCED DEGREES.

Every applicant for an advanced degree shall file at the Registrar's office, not later than the beginning of the semester preceding that in which the degree is sought, a formal application including a statement of the proposed course of study. This application must be approved by the major professor, and upon acceptance by the Faculty the applicant is admitted to candidacy for such advanced degree. It is advisable that such application be made as early as possible in the student's course. Where a thesis is required it shall be upon a subject approved by the major professor, and shall be presented in its final form at least six weeks before the close of the semester in which the degree is sought. Accepted theses shall be bound in a uniform style and deposited in the University library. No advanced degree will be conferred except upon the recommendation of the appropriate Faculty committee.

The degree of *Master of Arts* (A. M.) is conferred upon graduates of this University, and upon others who have had an equivalent training elsewhere, on the satisfactory completion, in residence, of one year of graduate work, beyond the baccalaureate requirements of the department in which the degree is sought, and on the presentation of an approved thesis, or the passing of a satisfactory examination, or both. The course of study for the Master's degree is intended to correspond in amount and character to the first year's work for the Doctor's degree.

In the departments of applied science the professional degree of *Engineer* is conferred upon graduates of this University, and upon others who have had an equivalent training elsewhere, on the satisfactory completion, in residence, of one year of professional study beyond the baccalaureate requirements of the department in which the degree is sought, and on the presen tation of an approved thesis, showing ability to do independent work.

The degree of *Doctor of Philosophy* (Ph. D.) is conferred upon graduates of this University, and upon others who have had an equivalent training elsewhere, on the satisfactory completion of at least three years of graduate work, beyond the baccalaureate requirements of the department in which the degree is sought, under the following conditions:

1. The degree is given only on the ground of advanced scholarship and the ability to do independent work in some special line, and not for merely faithful study for a prescribed time or course, nor for miscellaneous study. Three years represent the minimum time in which the degree can be obtained, and often a longer period of study will be necessary.

2. Graduate work done elsewhere may be accepted in place of resident study in this University; but in no case will private study without sufficient guidance, or pursued at a distance from libraries or laboratories or other necessary facilities, be accepted as an equivalent; and no degree will be granted

to any person who has not spent at least the last year of such study in residence at this University.

3. The course of study shall embrace one major subject and one or two minors in related departments. The minor subject or subjects shall represent approximately one-third of the course of study; except that such minor subjects may be waived, on the recommendation of the department in which the major subject is taken and with the approval of the Faculty, whenever the general preparation or special needs of the candidate make such a course seem desirable.

4. The candidate must present a thesis of such a character as shall display power of original and independent investigation and constitute an actual contribution to knowledge. He must guarantee the printing of the thesis, in a form approved by the Faculty, within one year after the degree is conferred, and must deposit one hundred copies in the University library.

5. The candidate must sustain such final examinations in major and minor subjects as may be prescribed by the departments in which such studies are taken, and also shall submit to such tests or examinations as may be required by the special committee of the Faculty. This special committee jointly with the department in which the major work is taken shall be responsible for the fitness of the candidate. The committee for this purpose shall be appointed as soon as possible after the candidacy is announced and at least a semester previous to the time of conferring the degree.

No honorary degrees are given.

EXPENSES OF THE STUDENT.

Tuition in all Departments of the University is free. In 1894–95 all graduate students, except regularly accepted candidates for advanced degrees, and all undergraduate students, will be charged a registration fee of *ten dollars* per semester,

payable on registration; and all special students a registration fee of *fifteen dollars* per semester, payable on registration. In addition, students in laboratory courses pay for the materials which they use. The deposits required in advance are different for the different courses, ranging from two to twenty dollars per semester.

Encina Hall and Roble Hall are managed by the students on the co-operative plan. The present year the cost of living, including board, furnished rooms, light, heat, and attendance, has amounted to twenty dollars per month. Students furnish their own linen, blankets, towels, and napkins. Rooms may be reserved in advance by depositing two dollars with the Registrar.

In the two villages of Palo Alto and Mayfield, each about a mile from the University, good rooms and board, in private houses, can be obtained at from eighteen to twenty-five dollars per month. Houses can also be rented for the use of clubs and societies. Special commutation tickets are issued by the Southern Pacific Company, and students living in towns on the line of the railway, from San Francisco to San Jose, can easily go to and from the University daily. Omnibuses connect with all trains at Palo Alto and Mayfield. A careful list of available boarding places outside the Halls, compiled by the Christian Associations, may be consulted at the Registrar's office during the opening week in September, and new students will find no difficulty in securing accommodations after their arrival.

The expenses of the student, exclusive of clothing and railway fares, need not exceed $225 to $300 per year.

SELF-SUPPORT OF STUDENTS.

No provision has been made for affording direct pecuniary assistance to students, but a considerable number manage in one way or another to earn the whole or a part of their expenses while attending the University. Such opportunities

occur in the line of office and laboratory assistance, personal services of numerous kinds, and the management of various student enterprises. Nothing, however, can be assured in advance, and no one is advised to come to the University without resources for at least one semester.

Departments and Courses of Instruction.

[*Courses for 1893-94, with Announcements for 1894-95.*]

GREEK.

Professor MURRAY, and Associate Professors W. MILLER and FAIRCLOUGH.

UNDERGRADUATE COURSES.

The undergraduate courses in Greek are intended to train the student carefully in the language itself, to acquaint him with the authors studied as representing the great departments of literature, and to enable him to approach intelligently the problems of Greek life and Greek thought. The instruction in the lower classes is given chiefly by means of recitations, but as the student advances these are supplemented by lectures.

It will be seen that provision is made for those who have had no Greek before coming to the University.

1. Elementary. *5 hrs., both semesters.* (MURRAY.)
Grammar; translation of easy prose; Greek composition. After the essential grammatical forms have been mastered passages of continuous prose are taken up for translation and, as soon as is practicable, the Anabasis. The student is made familiar with the ordinary forms of syntax, and exercises in writing Greek are regularly introduced.

2. The Cyropædia of Xenophon. *3 hrs., 1st semester.* (W. MILLER.)
Course 2 is open to all those who have offered subject 22 on entrance, or who have completed course 1 in the University.

3. Homer, the Odyssey. *3 hrs., 2d semester.* (W. MILLER.)
A continuation of course 2.

4. Prose Composition and Sight Translation. *2 hrs., both semesters.* (W. MILLER.)

The training in writing Greek will be based upon the text of the Cyropædia. This course is required of students in courses 2 and 3 who are making Greek their major.

5. **Homer.** *3 hrs., 1st semester.* (FAIRCLOUGH.)
A study of the Iliad and Odyssey with discussions and papers on Homeric topics. Open to those who have completed courses 2, 3, and 4, or an equivalent.

6. **Demosthenes.** *3 hrs., 2d semester.* (FAIRCLOUGH.)
The Olynthiac and Philippic Orations.

7. **Prose Composition and Sight Translation.** *2 hrs., both semesters.* (FAIRCLOUGH.)
Open only to those who have completed course 4, or an equivalent.

8. **Greek Tragedy.** *3 hrs., both semesters.* (MURRAY.)
The Prometheus Bound, the Œdipus Tyrannus, and the Iphigenia Taurica will be read in the class-room, and other plays will be assigned for private study.

GRADUATE COURSES.

The graduate courses in Greek are intended especially for those who are working for advanced degrees or who are looking forward to teaching. They differ from the undergraduate courses, announced above, in that they claim a larger share of the student's time and lead him to a broader and more comprehensive knowledge of the language and literature. He is introduced to higher philological work and is trained through critical studies for original research.

The center of the work is the Greek seminary—made up of the director and such students as satisfy him of their fitness for the work. The seminary meets weekly for the critical interpretation of some Greek author, the different members, in turn, filling the post of interpreter. Topics for investigation are assigned, and papers prepared by the members are read and discussed.

Members of the seminary are expected to supplement their critical work by wide reading, and lectures on the author or authors under discussion are given by the director.

9. The Greek Seminary. *2 hrs., both semesters.* (MURRAY.)
In 1894–95 the work of the seminary will center in Aristophanes. The Wasps will be taken up for interpretation.

[Students should provide themselves in advance with J. van Leeuwen's edition of the Wasps, Leyden, 1893, and with Kock's editions of the Clouds, Knights, Birds, and Frogs (Berlin, Weidmann). Indispensable are also complete texts of the tragedians and of Aristophanes, for example, those in the Teubner series. All of these works may readily be obtained of B. Westermann & Co., 812 Broadway, New York.]

10. Lectures on Greek Comedy. *1 hr., both semesters.* (MURRAY.)

11. Readings in Aristophanes. *1 hr., 1st semester.* (MURRAY.)

12. Lectures on Greek Syntax. *1 hr., 2d semester.* (MURRAY.)

[13. Archæological Seminary. See p. 49.]

LATIN.

Professor PEASE, and Associate Professors W. MILLER and FAIRCLOUGH.

UNDERGRADUATE COURSES.

The aim of the undergraduate courses in Latin is to give the student a somewhat systematic knowledge of the language and its development, an acquaintance with the main features of the literature, and some idea of the Roman civilization. The instruction is given chiefly by means of recitations and informal lectures. As the student advances in his Latin studies he is encouraged more and more to make use of the library, and to become familiar with the standard books of reference.

1. Cicero and Vergil. *5 hrs., both semesters.* (———.)
Cicero, five orations; Vergil, six books of the Æneid; exercises in Latin composition and sight reading.

This course is planned for those who have passed in entrance subject 20. It is regarded as preparatory to the work required of major students in Latin.

2. Cicero, Livy, and Terence. *3 hrs., both semesters.* (FAIRCLOUGH.)
Cicero, De Senectute; Livy, books XXI-II; Terence, Andria.

Open to students who have passed in course 1, or in subject 21 of the entrance requirements. After a hurried grammatical review, the chief aim will be to gain as great facility as possible in reading.

3. Translation at Sight and Latin Composition. *2 hrs., both semesters.* (W. MILLER.)

This course is open to students who are taking course 2, and is required of major students in Latin. Training in the rapid reading of Cicero's De Amicitia, Livy, book I, and Nepos will be given one hour a week, and the other hour will be devoted to Latin composition in connection with the Cicero and Livy of course 2, and to the study of the private life of the Romans in connection with the Terence.

4. Horace, Velleius Paterculus, and Tacitus. *3 hrs., both semesters.* (W. MILLER.)

Horace, selections from the Satires, Odes, and Epistles; Velleius' account of Tiberius, and selections from Tacitus.

This course, open to those who have passed in course 2, will aim to give a comprehensive view of these authors and their place in the literature. Attention will be directed especially to the subject matter and style.

5. Translation at Sight and Latin Composition. *2 hrs., both semesters.* (FAIRCLOUGH.)

This is open to students who have taken course 3. One hour a week the class will read Cicero's Second Philippic, and selections from Ovid's Metamorphoses, the Germania of Tacitus, and Pliny's Letters. Special effort will be made to get at the Roman point of view and to grasp the meaning in the order of the Latin. The exercises for translation into Latin will be prepared to suit the needs of the class.

6. Latin Comedy. *3 hrs., 1st semester.* (FAIRCLOUGH.)

This course will treat of the development of Latin comedy, of the early theatre, and the method of presenting a play. The Trinummus of Plautus will be studied with particular reference to the early forms, constructions, and metres; and that followed by the more rapid reading of the Menaechmi, Captivi, Miles Gloriosus, and the Adelphœ of Terence.

7. The Letters of Cicero and Pliny. *3 hrs., 2d semester.* (PEASE.)

The aim will be to get a view of Cicero and his times from the original sources, to see some of the causes for the breaking down of the Republic, and to become familiar with official procedure in the judicial and legislative bodies. Special attention will be paid to the familiar style of Cicero's letters, and a few letters of Pliny will be read in contrast.

8. Catullus, Tibullus, and Propertius. *2 hrs., 1st semester.* (PEASE.)
Selections from these authors will be studied, largely with reference to the thought and artistic form, and compared with similar poems of other writers. Other selections will be read in translation in order to gain a comprehensive view of their works as a whole.

9. Roman Society in the First Century. *2 hrs., 2d semester.* (FAIRCLOUGH.)
Illustrative selections will be read from the Satires of Juvenal and the Epigrams of Martial. Supplementary reading will be assigned in various writers on that period.

10. Lucretius, De Rerum Natura. *2 hrs., 1st semester.* (PEASE.)
Selections will be read in Latin and the rest in translation with reference to the philosophic thought and its poetic treatment.
[Course 10, alternating with course 8, will not be given in 1894-95.]

11. Quintilian. *2 hrs., 2d semester.* (FAIRCLOUGH.)
In addition to the study of the subject matter of books X and XII, considerable attention will be paid to the history of Roman literature of the first and second centuries, A. D.
[Course 11, alternating with course 9, will not be given in 1894-95.]

12. The Private Life of the Romans. *2 hrs., 1st semester.* (PEASE.)
This course will consist of a series of lectures illustrated with lantern slides and photographs, and supplemented by papers on special topics by the students. It is designed to give a view of the Romans in their home life and daily occupations, and to familiarize the student with their domestic and social institutions.
[Course 12 will not be given in 1894-95.]

13. Greek and Roman Mythology. [See under Archæology, course 2.]

14. Teacher's Course. *2 hrs., 1st semester.* (PEASE.)
This is a course of lectures and recitations intended for those who expect to engage at once in preparatory teaching. The lectures will treat of the aims and methods of teaching preparatory Latin, the books and other helps serviceable to teachers, and such practical questions as pronunciation, sequence of tenses, indirect discourse, and the like. There will also be practice in writing Latin and in teaching. Portions of the authors suitable for preparatory work will be read in class and the members will serve in turn as teachers under the supervision of the instructor. Opportunities will also be given to visit preparatory classes in the vicinity and reports of the observations will be presented by each member.

15. Fragments of Early Latin. *1 hr., 2d semester.* (PEASE.)
Schneider's Exempla Selecta Dialecti Latinæ Priscæ et Falisæ (Leipzig, 1886, Teubner) will be read in class and serve as a basis for the study of early forms.

This course is open to graduates, and to undergraduates of advanced standing.

GRADUATE COURSES.

The graduate courses in Latin are intended primarily for students who are looking forward to teaching as their profession. They aim to give a wider acquaintance with the language and literature than is usually afforded in undergraduate courses, and to offer training in philological criticism and in the methods of scientific research. The work centers in the Seminary, a body composed of the director and such graduate students as shall satisfy the director of their fitness for the work; in this, the students present the results of their study in the way of interpretations, reports, reviews, and original papers. The director selects an author or group of authors for the year's work, encourages a wide reading of Latin on the part of the student, usually with some particular end in view, assigns separate portions of the author in hand for minute and critical study as the basis of the interpretations, suggests topics for investigation, guides the members in their private work, and presides at the regular meetings. The work of the Seminary is supplemented by lectures on related subjects.

16. Latin Seminary. *2 hrs., both semesters.* (PEASE.)
In 1894-95 the Seminary will be occupied with the study of Vergil. Two meetings a week will be devoted to the interpretation of selections from his various works and to the discussion of papers presented by the members.

[Students should provide themselves in advance with some good text edition of Vergil (Carmina ed. G. Thilo, Leipzig, 1886, or Ribbeck, Leipzig, 1867, or Haupt, Leipzig, 1873), and Bæhrens, Poetæ Latini Minores, vol. II. It is also desirable to have Mueller's or Vahlen's edition of Ennius, and Eyssenhardt's Macrobius. These books may be ordered through any importer.]

17. **Epic Poetry.** *1 hr., 1st semester.* (PEASE.)
Lectures on Vergil and the development of Epic poetry.

18. **The Georgics.** *1 hr., 2d semester.* (FAIRCLOUGH.)
Lectures interpreting Vergil's Georgics.

19. **Practical Exercises** in Oral and Written Translation. *2 hrs., 1st semester.* (PEASE.)

20. **Latin Grammar.** *1 hr., 2d semester.* (PEASE.)
Lectures on the cases.

21. **A Journal Club** will hold regular meetings to hear reports on articles of interest in current periodicals.

ARCHÆOLOGY.

Associate Professor WALTER MILLER.

The work will center around the collections of ancient art in the Leland Stanford Junior Museum. These comprise a vast number of original works and copies from Italy, Greece, and Asia Minor, including a large part of the Cesnola collection from Cyprus. The work in this department will be in the line of the historical development of art.

1. **Archæological Seminary.** *1 hr., both semesters.* (W. MILLER.)
Interpretation of Pausanias' Description of the Acropolis of Athens, with oral and written discussions of the objects described. Open only to students who have pursued the study of Greek at least four semesters in the University.

2. **Greek and Roman Mythology.** *2 hrs., 2d semester.* (W. MILLER.)
A study of the Greek and Roman myths by means of ancient sculptures and vase-paintings. Lectures and recitations, with Seemann's Mythology and Gayley's Greek Myths in English Literature, for collateral reading.
[Course 2 is given in alternate years, and will not be offered in 1894-95.]

3. **Introduction to the Study of Classical Archæology.** *2 hrs., both semesters.* (W. MILLER.)
Illustrated lectures. Open to all students.

SANSKRIT.

1. **Beginner's Course in Sanskrit.** *2 hrs., both semesters.* (W. MILLER.)

Primarily for graduates. Recitations from Whitney's Sanskrit Grammar and Perry's Primer, accompanied by lectures upon the comparative phonetics of the Sanskrit, Greek, Latin, and Germanic languages, and followed by the interpretation of selections from Lanman's Sanskrit Reader.

GERMAN.

Professor GOEBEL, Associate Professor GRIFFIN, and Assistant Professor WICKHAM.

The aim of the elementary classes in this department is to give the student a thorough knowledge of German grammar and to enable him to acquire facility in reading German. The more advanced classes take up the study of the poets and writers of the classical period, and it is intended to offer, by the reading and interpretation of these authors, an equivalent for the study of the ancient languages to those not taking Latin or Greek in their University course. The general responsibility for the language work in this department rests with Associate Professor Griffin; the work in Literature and Philology with Professor Goebel.

1. **Elementary.** *3 and 5 hrs., both semesters.* (GRIFFIN, WICKHAM.)

Brandt's German Grammar and German Reader; Harris' German Composition; Bernhardt's Novelletten; translation of easy prose and poetry.

Course 1 is intended for those beginning the study of the language.

[In 1894-95 the number of sections in course 1 will be limited to three: two five-hour sections and one three-hour section. Students who have had training in Latin, and students who have some knowledge of German, but not sufficient to enable them to pass in entrance subject 19, will be admitted to the three-hour section.]

2. **Second-Year German.** *3 hrs., both semesters.* (GRIFFIN, WICKHAM.)

Egmont, Schiller's Briefe, and Emilia Galotti. [In 1894-95, William Tell, Lessing's Prosa, and Goetz von Berlichingen.] Advanced grammar

and composition, von Jagemann's German Prose Composition, translation at sight.

Open to students who have completed course 1 or its equivalent, or who have received credit for entrance subject 19.

3. **Goethe, Schiller, Lessing.** *2 hrs., both semeters.* (GRIFFIN.)

a. Goethe's Iphigenie. Interpretation, with lectures on the history of the development of the Ideal of humanity in the 18th century. [In 1894–95 Lessing's Nathan der Weise will be read, with lectures on Lessing as a dramatist and as a social and religious reformer.] (First semester.)

b. Schiller's Æsthetic Essays, with lectures on Schiller's philosophy of lyric and dramatic poetry. [In 1894–95 Hermann und Dorothea will be read, in connection with critical essays on the form of the poem, and the æsthetic laws of epic poetry, by A. W. von Schlegel, W. von Humboldt, and Victor Hehn.] (Second semester.)

Open to students who have had courses 1 and 2, or their equivalent.

4. **German Conversation and Rapid Reading.** *1 hr., both semesters.* (WICKHAM.)

Open to students who have completed course 1.

5. **Advanced German Composition.** *1 hr., both semesters.* (GRIFFIN.)

White's Prose Composition.

Open to students who have completed course 1, or its equivalent.

6. **Goethe, Schiller.** *2 hrs., both semesters.* (GOEBEL.)

a. Goethe's Tasso. Interpretation, with lectures on Goethe's life and artistic development. [In 1894–95 Goethe's Faust will be studied, with lectures on the development of the Faust legend, the history of Goethe's Faust and its philosophical and ethical ideas.] (First semester.)

b. Schiller's Briefe ueber die æsthetische Erziehung des Menschen. Interpretation, with lectures on Schiller's philosophy of art and the beautiful. [In 1894–95 Schiller's essay, Ueber naive und sentimentalische Dichtung, will be read, with lectures on the history of literary criticism in Germany.] (Second semester.)

7. **History of German Literature.** *2 hrs., both semesters.* (GOEBEL.)

Lectures on the period from Luther to Goethe, with parallel readings. [In 1894–95 lectures on the history of German literature from the earliest times to the Reformation, will be given, with parallel readings (Max Müller's Classics).]

GRADUATE COURSES.

The graduate courses in German, for which a thorough knowledge of modern German and the knowledge of Latin at least is required, are intended especially for students who will make the teaching of German their later profession. Careful attention will be given to the linguistic as well as to the literary training of the student, aiming at a comprehensive insight into the historical growth of the Germanic languages and literatures. The scientific methods of original and critical research will be taught and practiced in the seminary. Such students as have given satisfactory proof of their ability as independent investigators will be admitted to the degree of Ph. D., after having presented a thesis containing a contribution to science, and having fulfilled the other requirements prescribed by the University.

8. Middle-High German. *2 hrs., both semesters.* (GOEBEL.)

a. Middle-High German Grammar, with readings from Weinhold's Lesebuch. (First semester.)

b. Interpretation of the poems of Walther von der Vogelweide, with lectures on the life and times of Walther. [In 1894–95 the Nibelungenlied will be interpreted, with lectures on the history of the German hero-legend.] (Second semester.)

9. Old-High German. *2 hrs., both semesters.* (GOEBEL.)

a. Old-High German Grammar, with readings from Branne's Lesebuch. (First semester.)

b. Critical Study of Otfried. (Second semester.)

10. Old Norse. *2 hrs., both semesters.* (GOEBEL.)

a. Old Norse grammar, with readings from Brenner's Altnordischem Handbuch. (First semester.)

b. Saemudar Edda. Interpretation of the heroic lays of the older Edda, in connection with the course on the Nibelungenlied. (Second semester.)

11. Gothic. *2 hrs., 2d semester.* (GOEBEL.)

Gothic grammar with lectures on the comparative grammar of the Germanic dialects and interpretation of select passages from Ulfias.

12. **German Seminary.** *2 hrs., both semesters.* (GOEBEL.)
In 1894–95 the work of the seminary will chiefly consist of the study of Tacitus' Germania in its relation to Germanic Antiquities and Mythology.

ROMANIC LANGUAGES.

Professor MATZKE, and Assistant Professors BRUN and SYMINGTON.

1. **Elementary French.** *5 hrs., both semesters.* (BRUN, SYMINGTON.)
Grandgent's Short French Grammar (Heath & Co., Boston), with written exercises and systematic training in French pronunciation on the basis of Koschwitz, *Les Parlers Parisiens* (Welter, Paris, 1893); Super's French Reader, Erkmann-Chatrian, *L'histoire d'un Paysan*, Berthet, *Le Pacte de Famine* (Heath & Co., Boston); Labiche, *Le Voyage de Monsieur Perrichon* (Jenkins, N. Y.); Francisque Sarcey, *Le siége de Paris.*
In this course the study of the language is taken up from the beginning. Stress is laid upon the acquisition, theoretically and practically, of a correct pronunciation, but no direct attempt is made to teach French conversation. The student's entire energy is concentrated upon the attainment of a full and accurate reading knowledge of the language, to which end grammar and composition are made systematically to contribute.
Open to all, but students desiring to enter after the end of the second week, will be admitted only upon special examination.

2. **Modern French.** *5 hrs., both semesters.* (SYMINGTON, BRUN.)
Novels: De Vigny, *Cinq-Mars* (ed. Sankey, Heath & Co., Boston); Balzac, *Eugénie Grandet* (ed. Petilleau, Schoenhof, Boston).
Drama: Racine, *Britannicus*; Hugo, *Hernani* (ed. Matzke, Heath & Co., Boston); Augier, *Le Gendre de Monsieur, Poirier*; Pailleron, *Le monde où l'on s'ennuie* (Jenkins, N. Y.); Sandeau, *Mlle. de la Seiglière* (ed. Warren, Heath & Co., Boston).
Contes: Bercy's, *Contes et Nouvelles Modernes* (Jenkins, N. Y.).
Poetry: Bowen's Modern French Lyrics (Heath & Co., Boston).
French Literature from the XVII to the XIX century: Duval, *Histoire de la Littérature Française* (Heath & Co., Boston).
Prose Composition: Fasnacht's Progressive French Course, III (Macmillan, 1882).
A course in reading and introduction to French literature. Systematic attention will be paid to syntax and idiom. One recitation per week (the reading of modern comedies) will be conducted in French, where the texts read will be interpreted in French, and instruction in conversation will be given.

Open to students who have completed course 1, or who have received credit for entrance subject 18.

3. Modern French. *3 hrs., both semesters.* (BRUN.)

De Vigny, *Cinq-Mars* (ed. Sankey, Heath & Co., Boston); Pierre Loti, *Pêcheur d'Islande* (Heath, Boston); Racine, *Britannicus*; Hugo, *Hernani*, (ed. Matzke, Heath, Boston); Sandeau, *Mlle. de la Seiglière* (ed. Warren, Heath & Co., Boston); Bercy, *Contes et Nouvelles Modernes* (Jenkins, N. Y.); Fasnacht's Progressive French Course, III (Macmillan, 1882).

A course in rapid reading, open to students who have completed course 1, or who have received credit for entrance subject 18.

4. Classical French. *3 hrs., both semesters.* (SYMINGTON.)

The class will begin with a study of French tragedy. There will be read Corneille's *Cid*, *Horace*, and *Polyeucte*, Racine's *Athalie*, *Iphigénie*, and *Phèdre*, Voltaire's *Mérope*, *Zaïre*, Ponsard's *Lucrèce*. When this has been completed, the class will take up Crane, *La Société Française au XVIIe Siècle*, and Molière's *Précieuses Ridicules*, *Le Bourgeois Gentilhomme*, *Le Tartuffe*, and *Le Misanthrope* will be read.

Lectures on French literature from the beginning to the XVII century. [In 1894-95 a summary view of the whole of French literature from the beginning to the present time will be given.]

Original essays in French.

Open to students who have completed course 2.

5. Literary France from 1801 to 1848. *2 hrs., 1st semester.* (MATZKE.)

Lectures, supplemented by readings and reports by the members of the class. Students should provide themselves with Pellissier, *Le mouvement littéraire au XIXe siècle* (Paris, Hachette, 1889), and Stapfer, *Racine et Victor Hugo* (Colin et Cie., Paris, 1890).

Open to students who have completed course 4.

6. French Literary Criticism. *2 hrs., second semester.* (MATZKE.)

Critical study of selections from Boileau, Sainte-Beuve, Faguet, and Brunetière.

Open to students who have completed course 4.

7. Spanish. *3 hrs., both semesters.* (SYMINGTON.)

Manning, Practical Spanish Grammar (Holt, N. Y.); Knapp, Spanish Reader (Ginn & Co., Boston); Valdés, José (Madrid, 1885); Tamayo y Baus, *Un drama nuevo*; Caballero, *La Familia de Alvareda.*

Open to students who have completed French course 1.

8. Italian. *3 hrs., both semesters.* (MATZKE.)
Grandgent, Italian Grammar and Italian Composition (Heath & Co., Boston); De Amicis, *Camilla* and *Gli amici di colleggio* (Jenkins, N. Y.); Manzoni, *I promessi sposi*; Dante, *Divina Comedia.*
Open to students who have completed French course 1.

GRADUATE COURSES.

Courses of instruction for graduate students in Romanic philology and literature lead to the degrees of Master of Arts and Doctor of Philosophy, and are planned for the benefit of specialists, particularly of such as are looking forward to becoming college teachers of the Romanic languages. Admission to regular standing in this department presupposes an undergraduate curriculum of study which has included Latin and French, and has afforded proficiency in at least one of the principal languages of the Romanic group (French, Spanish, or Italian). In addition to this, a good reading knowledge of German (for purposes of advanced study) is requisite. Candidates satisfying these requirements may devote themselves to special studies in Romanic philology, under the systematic daily instruction and guidance of the professor, and to the preparation of papers involving critical investigation and original research. In connection with this special work, graduate students will be expected to take, under the advice of their professor, such undergraduate courses in the Romanic languages as may supplement their previous studies, and also such graduate courses in related departments as will serve to broaden their general acquaintance with philology and literature.

The course of study is intended to cover a period of three years, and during that time the principal subjects connected with Romanic Philology, such as Old French Dialects, History of Romanic Versification, Popular Latin, Provençal Language and Literature, French, Italian, and Spanish Literature, will be treated. The courses outlined below cover what is considered as the necessary first year's work.

9. Interpretation of Old French Texts. *2 hrs., both semesters.* (MATZKE.)

Bartsch-Horning, *La langue et la littérature françaises* (Paris, 1887).

10. French Historical Grammar. *2 hrs., both semesters.* (MATZKE.)

Lectures on Old French phonology and morphology. Students should provide themselves with Schwan, *Grammatik des Altfranzösischen* (2d edition, Reisland, Leipzig, 1893), Suchier, *Le français et le Provençal, traduction de Monet* (Bouillon, Paris, 1891), Koerting, *Lateinisch-Romanisches Wörterbuch* (Schöningh, Paderborn, 1891).

11. Pro-seminary. *1 hr., both semesters.* (MATZKE.)

The work will develop in close parallel growth with the lectures on Historical Grammar, and will consist in practical philological exercises based upon Suchier's edition of *Aucassin et Nicolete* (Paderborn, 1889).

12. Lectures on the History of French Literature. *1 hr., both semesters.* (SYMINGTON.)

a. French Epic poetry (first semester); *b.* French Lyric poetry (second semester).

13. Physiological Phonetics. *1 hr., 1st semester.* (MATZKE.)

Lectures. Students will need Sievers, *Grundzüge der Phonetik* (Leipzig, 1885); Beyer, *Französische Phonetik* (Cöthen, 1888); Paul Passy, *Les sons du Français* (Paris).

14. Old Spanish. *1 hr., 2d semester.* (MATZKE.)

Critical study of the *Poema del Cid* (ed. Volmöller, Halle, Niemeyer, 1879).

ENGLISH LITERATURE AND LANGUAGE.

Professors ANDERSON and FLÜGEL, Associate Professor HUDSON, Assistant Professors NEWCOMER and LATHROP, and Assistants K. J. SMITH and VANCE.

The aims of the courses in English are: (1) To give training in the formulation and expression of thought; (2) to impart a scientific knowledge of the English Language and of literary history, English and European; (3) to acquaint the student with a juster and more liberal method of literary criticism; (4) to introduce him to literature as an art,—to cultivate a refined appreciation of what is best and thus to reveal unfailing sources of pure enjoyment.

Every one of the courses subserves more or less distinctly one or more of these aims; some perhaps subserve them all. In selecting courses the student should observe some system, according as he desires to give greatest prominence to literature, philology, or composition. While no candidate for graduation in English will be permitted to neglect any one of these three phases of English study, every such candidate must do special work in one of the three. No candidate whose course is unsatisfactory to the Department will be recommended for a degree.

A good reading knowledge of the chief modern European languages, especially French and German, is requisite for some of the more advanced courses, and is desirable for all. Students intending to make English their major subject are advised to offer one or more languages, ancient or modern, for entrance, and to continue these subjects in the University. Students entering without such preparation are advised to begin the study of these languages as early in their course as possible. Students making a specialty of English philology will find a knowledge of Latin indispensable.

For graduation in English at least forty hours of work in this department are required, *i. e.*, five hours of work per week for eight semesters. No student will be considered a candidate for the bachelor's degree in English until he shall have passed satisfactorily in courses 8, 22, 23, 25, and 26.

Courses 3, 4, 12, 13, and 21 are open to students who have received credit for entrance subject 1*a*; for all other courses 1*b* will be required. In no case will a student be admitted to an advanced course without permission from the instructor.

In order to enter the University as a Special Student in English the applicant must be at least twenty years of age (see p. 35), and must satisfy entrance requirement 1*a* and 1*b*.

3. English Prose Writers of the Nineteenth Century. *3 hrs., 1st semester.* (NEWCOMER, LATHROP.)

Macaulay, De Quincey, and Carlyle. Lectures, discussions, and reports, written and oral.

[Minto's Manual of English Prose; Macaulay's Essays; De Quincey's Joan of Arc, etc. (ed. Hart); Carlyle's Essays.]

4. **English Prose Writers of the Nineteenth Century.** *3 hrs., 2d semester.* (NEWCOMER, LATHROP.)

Landor, Matthew Arnold, Lowell.

[Landor's Conversations (Camelot Classics), Calvin's Selections from Landor (Golden Treasury Series), Lowell's "My Study Windows," Arnold's "Essays in Criticism" (Second Series).]

8. **English Composition.** *2 hrs., 1st semester.* (NEWCOMER, LATHROP.)

Three themes a week and an essay every two weeks.

[Scott and Denney's Paragraph-Writing; Bigelow's Handbook of Punctuation, and either the Standard Dictionary or Webster's International Dictionary.]

9. **Forensics.** *2 hrs., 2d semester.* (LATHROP.)

Practice in argument, oral and written, and in the preparation of briefs based upon the masterpieces of argumentative style.

Students must obtain the instructor's permission before registering for the course.

[Baker's Specimens of Argumentation, Baker's Specimen Briefs.]

11. **English Composition.** *2 hrs., 2d semester.* (NEWCOMER.)

An advanced course, with special reference to the philosophy of style and its practical application to various forms of literary art.

Students must obtain the instructor's permission before registering for this course.

12. **Homer.** *2 hrs., 1st semester.* (NEWCOMER.)

The Iliad and the Odyssey, studied from translations, as an introduction to English literature, especially to Spenser and Milton.

13. **Virgil and Dante.** *2 hrs., 2d semester.* (NEWCOMER.)

The Æneid and the Divine Comedy, studied from translations, as an introduction to English literature, especially to Spenser and Milton.

15. **History of the English Drama down to Shakspere.** *3 hrs., 1st semester.* (HUDSON.)

[Pollard's English Miracle Plays (Clarendon Press); Peele's Plays and Poems (Morley's Universal Library); Marlowe's Doctor Faustus and Greene's Friar Bacon and Friar Bungay (Clarendon Press); Marlowe's Edward II (Clarendon Press).]

16. The Contemporaries of Shakspere. *3 hrs., 2d semester.* (HUDSON.)

[Thayer's Best Elizabethan Plays; Jonson's Plays and Poems (Morley's Universal Library).]

17. Spenser. *3 hrs., both semesters.* (LATHROP.)

A critical examination of his works, with a study of his character, of the esthetic and moral qualities of his poetry, and of his relative position in the history of literature.

Open to students who have done satisfactory work in courses 12 and 13 and in one other English course, or in equivalent courses in other departments.

[Students in this course must be provided with a complete edition of Spenser's poems. The new Macmillan edition, in one volume, and the Riverside edition, in three volumes, are recommended.]

18. The Literature of the Eighteenth Century. *3 hrs., both semesters.* (HUDSON.)

A comparative study of the literature of the Augustan period, and the early romantic revival.

Open to those only who are familiar with either French or German.

[Gosse's Literature of the Eighteenth Century; Ward's English Poets, vol. III; Pope's Poetical Works (new Macmillan ed.); Swift's Tale of a Tub, etc., and Gulliver's Travels (Carisbrooke Library); Goldsmith's Miscellaneous Works (new Macmillan ed.); Cowper's Poetical Works (new Macmillan ed.). Editions of other eighteenth century authors, English and continental, in Cassell's National Library, and other inexpensive reprints, will also be used.]

19. English and American Poetry of the Nineteenth Century. *2 hrs., both semesters.* (HUDSON.)

From Keats to Tennyson and Whitman. A study of the principal movements in modern poetry, in connection with the speculative and industrial tendencies of the time. Open to students who have passed satisfactorily in at least three English courses or in equivalent courses in other departments. The point of view in this course will be mainly philosophical.

[Students must provide themselves with good editions of the works of Keats, D. G. Rossetti, Arnold, Clough, George Eliot, Tennyson, William Watson, Lowell, Emerson, and Whitman. Morris's Earthly Paradise should also be obtained, either complete or in selections.]

20. Thesis. In certain courses, students will be given an additional hour of credit on presentation of a satisfactory thesis embodying the results

of independent work. Permission to register for thesis work must be obtained in each case from the major professor.

21. **American Literature.** *3 hrs., both semesters.* (NEWCOMER.)
A survey of American literary history, and the reading and discussion of notable works in prose and verse. Students in this course are expected to possess the works of the chief American poets, especially Lowell, Longfellow, Whittier, Bryant, Poe, and Lanier.

22. **Anglo-Saxon.** *3 hrs., both semesters.* (FLÜGEL, K. J. SMITH, VANCE.)
a. Anglo-Saxon Grammar and Translation of Select Passages in prose and verse (first semester).
b. Introduction to the Study of Anglo-Saxon Literature (second semester.)
b is a continuation of *a*, but open to all students who have satisfied the instructors of their fitness. For both *a* and *b* some knowledge of either German or Latin is a pre-requisite.
[The text-books used in 1893-94 were Sievers's Old English Grammar (Angelsächsische Grammatik, 2d ed., 1886) translated by Cook (second ed., 1887); Bright's Anglo-Saxon Reader; Ten Brink's Early English Literature, translated by Kennedy. For *b* Stopford Brooke's History of Early English Literature is recommended.]

23. **Chaucer.** *3 hrs., both semesters.* (FLÜGEL.)
This course is an elementary one and includes an outline of Middle English Grammar for the beginner.
[Sweet's Second Middle English Primer, and either a complete edition of Chaucer's Works (the Riverside or the Aldine Ed. recommended), or Skeat's annotated editions of: (1) The Prologue, etc.; (2) The Man of Lawe's Tale, etc.; (3) The Minor Poems; (4) The Legend of Good Women. Besides these, Pollard's Chaucer Primer and the second volume of Ten Brink's Early English Literature, translated by W. C. Robinson, are recommended.]

24. **Wordsworth and his Contemporaries.** *3 hrs., both semesters.* (ANDERSON.)
The reading and discussion of some of the more notable poems of Burns, Blake, Chatterton, Cowper, Wordsworth, Coleridge, Southey, Landor, Scott, Byron, Shelley, Keats, and others, with a view first to an acquaintance with this body of literature, secondly to the spiritual, artistic, and political movement which these poets exemplify and interpret.
Open to students who have done satisfactory work in at least three other English courses.

[Ward's English poets, vols. III and IV. The student should also be provided with a good edition of each of the poets mentioned above. Macmillan's new single-volume editions of Coleridge, Shelley, Wordsworth, Scott, Burns, and Cowper are recommended.]

25. Milton. *3 hrs., both semesters.* (ANDERSON.)

A critical examination of the poems and of some of the prose works of John Milton and a study of his life and times, with a view to a realization of his character, a comprehension of his historical importance, and an appreciation of the classical quality of his poetry.

Open to students who have done satisfactory work in courses 12 and 13 and in one other English course, or in equivalent courses in other departments.

[Masson's smaller edition of Milton's Poems (three vols.), either Pattison's or Garnett's or Stopford Brooke's account of Milton's life and works, Hale's edition of the Areopagitica and Verity's annotated texts (Cambridge Press).]

[Course 25 alternates with course 24, and will not be given in 1894–95.]

26. Shakspere. *3 hrs., both semesters.* (ANDERSON.)

A comprehensive review of all the plays and poems attributed to William Shakspere, including a study of his life and an attempt to trace the growth of his mind and the development of his art.

Open to students who have done satisfactory work in courses 15 and 16. Those not thus qualified must obtain the instructor's permission before registering.

[The principal text-books are Dowden's Shakspere Primer, Saintsbury's Elizabethan Literature, the Leopold Edition of Shakspere with Dr. Furnivall's Introduction. Every student should also possess at least one volume of Furness's Variorum Edition. Schmidt's "Shakespeare Lexicon" is recommended.]

GRADUATE COURSES.

In connection with the following courses, opportunity will be afforded to graduate students to pursue lines of reading and investigation under the guidance of the professors. The courses offered lead to the Doctor's degree, but the specific requirements for the degree must vary with every individual. In no case will the degree be conferred except upon the completion of a thesis embodying the results of original work of a high order. More definite information will be furnished by the

members of the English staff to intending students who write giving the necessary information respecting their purposes and equipment. A very large proportion of the undergraduate courses, especially courses 9, 11, 17, 18, 19, 23, 24, 25, and 26, are adapted to the needs of graduates of other colleges, and are recommended to candidates for advanced degrees.

27. Shakspere: An Introduction to Textual Criticism. *3 hrs., both semesters.* (ANDERSON.)

Exact reprints of the quarto and folio texts of a few selected plays are collated, textual obscurities and verbal difficulties are carefully discussed, and a complete edition of one play is constructed by eac student from the original versions. Following upon the textual study of each play is a discussion of the *dramatis personæ*, an analysis of the author's dramatic methods, and an examination of various elements of his literary power.

Open to students who have completed course 26 or its equivalent.

[The necessary books are Vietor's parallel-text reprints of Hamlet and Lear, Daniel's of Romeo and Juliet (New Shakspere Society), and the reduced fac-simile of the first folio edition of the plays. Furness's Variorum Shakespeare and Schmidt's Shakespeare Lexicon are recommended.]

[Course 27 alternates with course 26, and will not be given in 1894–95.]

28. History of English Lyrical Poetry. *3 hrs., both semesters.* (FLÜGEL.)

From the earliest times to the middle of the sixteenth century. Lectures and interpretations.

[Students will need copies of (1) Grein's Bibliothek der Angelsächsischen Poesie, vol. 1 (ed. Wülker), (2) An Old English Miscellany (ed. R. Morris), (3) Altenglische Dichtungen des MS Harl. 2253 (ed. Böddeker), (4) Percy's Reliques (the editions by Wheatley or by Schröer are especially recommended), (5) Flügel's Neuenglisches Lesebuch, vol. 1.]

29. Historical Grammar of the English Language and History of Old and Middle English Literature. *4 hrs., both semesters.* (FLÜGEL.)

[Books used and recommended are: (1) Whitney's Life and Growth of Language (International Science Series); (2) Sayce's Principles of Comparative Philology; (3) Sievers's Anglo-Saxon Grammar; (4) Ten Brink's Chaucer's Sprache und Verskunst; (5) Ten Brink's Early English Literature, vols. 1 and 2; (6) Morris and Skeat's Specimens of Early English Literature, 2 vols.]

[Course 29 will be repeated in 1895–96.]

30. **Beowulf.** *2 hrs., both semesters.* (FLÜGEL.)
[The edition used is Harrison and Sharp's.]
[Course 30 will be repeated in 1895–96.]

31. **History of English Metres.** *2 hrs., 1st semester.* (FLÜGEL.)
From Anglo-Saxon times to the middle of the sixteenth century.
[Course 31 will not be given until 1895–96.]

32. **English Palæography.** *2 hrs., 2d semester.* (FLÜGEL.)
Lectures and exercises.
[Books recommended: (1) Skeat's Twelve Fac-similes of Old English MSS., (2) Thompson's Handbook to Greek and Latin Palæography (International Science Series).]
[Course 32 will be repeated in 1895–96.]

33. **English Seminary.**
a. King Alfred and his Circle. 4 *hrs., both semesters.* (FLÜGEL.)
Lectures and interpretations.
[Students will need copies of the following works, of which a closer study will be made: (1) Pauli's Alfred the Great (ed. Thorpe, Bohn's Antiquarian Library); (2) Alfred's Version of Boethius (ed. Fox, Bohn's Ant. Lib.); (3) Turk's ed. of the Legal Code of Alfred the Great; (4) Earle and Plummer's Saxon Chronicles; (5) Tho. Miller's ed. of the Old English Version of Bede's Ecclesiastical History; (6) Baedae Historia Ecclesiastica (ed. A. Holder, or ed. G. H. Moberly).]
b. Tennyson and Browning; Lowell. 3 hrs., both semesters. (ANDERSON.)
In 1893–94 a comparative study of Tennyson and Browning was undertaken. Papers treating of Tennyson's indebtedness to a number of preceding poets (Homer, Theocritus, Vergil, Dante, Shakspere, Milton, Spenser, Wordsworth, and others) were prepared and discussed; a detailed examination was made of Browning's *Sordello; Paracelsus* and many other of Browning's earlier poems and dramas were read; the dramatic works of the two poets were compared; likewise the *Dramatic Lyrics* and the *English Idylls;* their use of the Dramatic Monologue was examined, and the contrast between them as interpreters of the more positive thought of the age was abundantly illustrated.
In 1894–95 the seminary will enter upon a comprehensive study of the life, works, character, scholarship, and influence of James Russell Lowell. Among the topics to be examined will be Lowell's Puritan background and its influence; his intellectual and literary inheritance; his relations with Maria White, Emerson, Curtis, Agassiz, Holmes, and Longfellow; the significance of his satire; his political course and his career as a public

servant; his philological equipment; his competence and usefulness as a critic; the characteristics of his prose style; his letters; the power and quality of his poetry.

Every student pursuing this course should possess a complete set of Lowell's works.

SHORTHAND.

1. **Phonetic Shorthand.** *3 hrs., both semesters.* (G. A. CLARK.)

Preparation equivalent to that required for two hours. Counting two hours credit.

The course contemplates a study of the elementary sounds of the English language, a thorough drill in the principles of shorthand writing, and a practical application of the work in a series of exercises and lectures, the aim being to give students facility in the use of an art which may be of practical value to them in their work of note-making and composition.

PSYCHOLOGY.

Professor ANGELL.

1. **Elementary Psychology.** *3 hrs., 1st semester.* (ANGELL.)

Recitations, lectures, and preparation of abstracts. The course also calls for three hours a week of experimental work. The student should have a reading knowledge of German and be prepared in elementary physics and physiology.

2. **Advanced Psychology.** *2 hrs., both semesters.* (ANGELL.)

Lectures and preparation of abstracts and essays. Course 3 in laboratory work is required in connection with this course. Open to those who have completed course 1 or its equivalent.

3. **Laboratory Work in Experimental Psychology.** *2 hrs. (minimum), both semesters.* (ANGELL.)

4. **Physiological Optics.** *2 hrs., 2d semester.* (ANGELL.)

Open to students who have completed course 1 or its equivalent.

5. **Methods of Sensation Measurement.** *1 hr., both semesters.* (ANGELL.)

Open to students in courses 2 and 3.

ETHICS AND ETHICAL LITERATURE.

Associate Professor GRIGGS, and Assistant CORNISH.

The aim of this department is the study of concrete human life. The construction of ethical theories is not a primary pur-

pose in the work, and but a small part of the time is devoted to the criticism of theories. The aim is to accomplish in Ethics what is being done in the study of nature by the physical sciences, that is, to study in a scientific spirit, and with inductive methods, the actual, complex world of human life. To this end investigations are made into the facts of belief and conduct in the past and in the present time. Literature and other concrete expressions and studies of human life are regarded as valuable helps in the investigation of ethical questions. The problems of ethical life and thought are given an open and full discussion in various courses of lectures.

1. **Introduction to Ethics.** *2 hrs., 1st semester.* (GRIGGS.)
In this course a general discussion of ethical questions is given. The lectures are tentative rather than dogmatic in character, and are intended to suggest and stimulate thought, rather than to give final conclusions. The present condition of ethical problems is discussed, and an effort is made to show what light has come to ethical investigations from the results and methods of modern science. The subjects considered will include: The Meaning of Ethics, The Methods of Ethical Science, The Basis of the Ethical Life, The Evolution of Moral Ideas, The Laws of Life, The Ethics of the Personal Relations, Religion and Ethics, etc.

2. **Spiritual Teachers of the Nineteenth Century.** *3 hrs., 1st semester.* (GRIGGS.)
A study of selections from Carlyle, Emerson, Shelley, Wordsworth, Browning, and Tennyson, with reference to their ethical and spiritual teachings, and the application of these to questions of daily life.

3. **The Philosophy of Literature.** *2 hrs., 2d semester.* (GRIGGS.)
A discussion of the nature, sources, and relations of literature, and of the principles involved in the study of literature from the philosophical point of view. Among the topics discussed are the following: The Material of Literature, Literature and Other Arts, The Forces Behind Literature, The Lines of Study of Literature, The Attitude of Mind Necessary in the Study of Literature, Art Masterpieces of Literature.

4. **The Ethical Literature of the Bible.** *3 hrs., 2d semester.* (GRIGGS.)
Selections from both the Old and New Testaments are studied purely from the ethical and literary points of view. No attempt is made to construct or discuss theological doctrines. The objects are to understand the

ethical teachings, and appreciate the literary excellence of the Bible; to trace the evolution of Hebrew thought in connection with Hebrew life; and to find the relation of the thought of both the Old and New Testaments to present life.

[Course 4 will not be given in 1894-95.]

5. **Dante: A Study of the Divine Comedy.** *3 hrs., 1st semester.* (GRIGGS.)

[Course 5 will not be given in 1894-95.]

6. **Goethe: A Study of Faust.** *3 hrs., 2d semester.* (GRIGGS.)

The masterpieces of Dante and Goethe are taken up as concrete studies of human life, involving problems of permanent importance, and embodying the epochs and men that produced them. A comparison is made between the mediæval and modern views of the problems studied.

7. **The History of Greek Philosophy.** *2 hrs., 2d semester.* (CORNISH.)

Lectures in the history of Greek thought from Thales to the Neo-Platonists, with special reference to the inter-relation of the schools.

[Course 7 will not be given in 1894-95.]

8. **An Ethical Study of Autobiography.** *3 hrs., 1st semester.* (GRIGGS, E. BARNES.)

This course is a study of the problems of personal life. Revelations of personal experience in different historical epochs will be studied; and the problems which, in different forms, are constantly recurring will chiefly be considered. As these questions have the largest possible bearing on Education, the course will be conducted conjointly by the two departments. The texts will include: The Confessions of St. Augustine, The Autobiography of Benvenuto Cellini, The Confessions of Rousseau, The Autobiography of Goethe, The Journal of Amiel, The Confessions of Tolstoi, etc.

9. **Modern English Ethical Philosophy.** *3 hrs., 2d semester.* (GRIGGS.)

A comparative study of the most important modern English theories of Ethics, including the treatises of Spencer, Sidgwick, Stephen, Martineau, Green, and others.

Open only to advanced students.

10. **Seminary for the Study of Ethical Theories.** *2 hrs., 1st semester.* (GRIGGS.)

Each year some one philosopher is selected and his works critically studied, to determine his ethical theory in relation to other theories of conduct, to find the sources of his theory and its relation to the life of the

author's time, and to find its relation to ideals and conduct today. The subject for 1893-94 was Plato. The subject for 1894-95 will be Aristotle.

Open only to advanced students.

11. Seminary in the History of Morals. *2 hrs., 2d semester.* (GRIGGS.)

Devoted to special researches in the evolution of ethical conduct and ethical ideals. For 1894-95 the studies will be in the history of European morals.

Open only to advanced students.

[The courses in Ethics and Ethical Literature will not be given in 1894–95, on account of the absence of Professor Griggs in Europe.]

EDUCATION.

Professor EARL BARNES, and Instructor SCHALLENBERGER.

1. History of the Development of the European Intellect. *2 hrs., both semesters.* (E. BARNES.)

This course will trace the successive ideals of manhood and womanhood that have appeared in the historic period; will ask how these ideals arose, how the people tried to perpetuate them and with what success. It will be a study in the history of education in its broadest sense. The work will consist of studies on such records as are available in the library, and on leaflets specially prepared for the course, with occasional lectures.

2. The Intellectual Development of America. *2 hrs., both semesters.* (E. BARNES.)

This course will deal with the successive steps in our intellectual development as shown in our schools, literature, journals, and social and theological movements. The work will be presented in special studies and lectures, and will be given with special reference to the development of educational ideas.

3. Studies on Children. *2 hrs., both semesters.* (E. BARNES, SCHALLENBERGER.)

This course will deal with the physical, intellectual, and moral development of children. The work will consist of original studies on the children in the school connected with the department, or on children otherwise available, of statistical studies on data concerning the development of the senses, emotions, etc., collected from various schools, and of studies in the literature of the subject. To take up this work to the best advantage, students should have had at least an elementary course in psychology.

4. School Organization and Supervision. *2 hrs., 2d semester.* (SCHALLENBERGER.)

A comparative study of the organization and management of schools with a view to determining the influences, political, social, and pedagogical, that affect the formation, growth, and vitality of schools.

5. Comparative Study of European School Systems. *1 hr., 2d semester.* (E. BARNES.)

This course will consist of lectures and comparative studies on the school systems of England, France, Germany, and Switzerland.

6. Rousseau and Pestalozzi. *2 hrs., both semesters.* (E. BARNES.)

An historical and critical study of Rousseau's *Emile* and Pestalozzi's *Lienhard und Gertrud.*

This course is intended for those who wish to study these works, and at the same time to strengthen their use of French and German.

7. Methods of Teaching Subjects in Secondary Schools. *2 hrs., 1st semester.* (SCHALLENBERGER.)

In this course a series of lectures and lessons will be given by various members of the faculty outlining the place of their various subjects in a course of liberal study, and dealing with text-books, class room management, and general questions of method. It is believed that men who have made a special study of their departments can present work which will be of assistance to those intending to teach.

8. Study of Educational Classics. *2 hrs., both semesters.* (SCHALLENBERGER.)

For 1894-95 this course will consist of a critical and historical study of the works on education by Ascham, Bacon, Milton, Locke, Spencer, and such other classics as it may seem best to add.

[**9. School Hygiene, Anthropometry, and Physical Training.** See course 4 in Department of Physical Training and Hygiene.]

[**10. Teacher's Course in General Physiology.** See course 7 in Department of Physiology.]

[**11. An Ethical Study of Autobiography.** See course 8 in Department of Ethics.]

[**12. Teacher's Course in Latin.** See course 14 in Latin.]

13. Seminary. *2 hrs., both semesters.* (E. BARNES.)

For the study of problems in the psychology of childhood. Intended for those who have had course 3, or its equivalent, and who wish to take up special lines of investigation. The school connected with the department offers facilities for this work.

Students in this department will be required to take work in psychology, unless they are already well grounded in that subject; they are also expected to have a reading knowledge of French and German before graduating. Special work will be arranged for graduate students. Teachers not candidates for a degree, but wishing to carry on special studies in the department, will be given every assistance which the department can offer.

HISTORY.

Professor HOWARD, Associate Professor SHOW, and Assistant Professors M. S. BARNES and SPENCER.

1. History of Rome. *3 hrs., both semesters.* (SHOW.)
From the earliest times to the fall of the Western Empire, with special reference to institutions.

Course 1 is open to all students, and is required of first year students in History. It is designed to afford a general training in scientific method. The systematic use of books is had constantly in view. In class the work consists of informal lectures, critical discussions, and written reviews. During the year, in addition, every student is expected to present before the class oral or written reports on subjects assigned for special reading.

2. Mediæval Institutions. *2 hrs., both semesters.* (SHOW.)
Course 2 is open to second year students, and is designed to continue the work done in course 1. Beginning with the later imperial organization, it will trace the main development of European institutions from the fifth to the fifteenth century, with special reference to the Germanic polity, feudalism, and the rise of the great modern states. Themes and analyses will be expected from time to time. Some attempt will be made, also, to acquaint the students with proper methods of handling the original sources of the mediæval period.

3. History of the Pacific Slope. *3 hrs., 1st semester.* (M. S. BARNES.)
This is a general course, open to all, on the approval of the professor in charge, and giving a general view of the development of the Pacific Slope, during the Spanish, Mexican, and American periods. The leading topics are as follows: Native races and resources; the Spanish opening of the South; the English and Russian opening of the North; the American conquest; the social, political, and intellectual life of the American period. The weight of attention throughout will be given to the culture-history of the Slope.

4. History of the Main Political and Intellectual Movements of the Nineteenth Century. *3 hrs., 2d semester.* (M. S. BARNES.)

This is a general course, open to all, on approval of the professor in charge. The course deals with the development of the ideas of popular government, nationality, socialism, philanthropy, popular education, internationalism, and with the Europeanization of the backward races.

5. Church and State in the Middle Ages. *2 hrs., both semesters.* (SHOW.)

Course 5 is open to graduates and undergraduates who have taken course 2 or its equivalent. It will consider the relations of the early church to the pagan and Christian empires, the rise of the papacy, the foundation of the temporal power, the theory of the Holy Roman Empire, the conflicts of the church and the civil power, and similar topics. After the ninth century, special stress will be laid on the relations of the papacy to the German empire. Students will be guided in research work on selected topics.

[Course 5 will not be given in 1894-95.]

6. History of the Renaissance. *2 hrs., both semesters.* (SHOW.)

Open on the same conditions as course 5. After tracing briefly the earlier intellectual movements of the period, such as the literary revival under Charles the Great, the rise of scholasticism, the growth of the mediæval universities, the course will be devoted to a detailed study of the revival of learning, and the development of the new humanism in its relations to the intellectual, political, social, and religious life of the later middle ages. Incidental attention will be given to the characteristic art and literature of the period.

7. American Political and Institutional History to 1775. *2 hrs., both semesters.* (HOWARD.)

Course 7 is open to third year students, and to graduates. Without excluding other topics, it is devoted mainly to the constitutional history of the English colonies. The origin and development of the various types of local organization receive special attention. An attempt is made, in this period, to trace the beginnings of our present State and National Constitutions.

8. Constitutional and Political History of the United States since 1775. *3 hrs., both semesters.* (HOWARD.)

Course 8 is open to graduates and to undergraduates who have had courses 1 and 2, or their equivalent. It should, when practicable, be preceded by course 7. It is a study of the Revolution, the Critical Period, and the formation and development of the National Constitution. Attention is

given to the various types of local organization. This course is important as a preparation for the study of law.

9. History of the English Constitution to 1485. *2 hrs., both semesters.* (HOWARD.)

Course 9 is open to graduates and advanced undergraduates. It is designed to afford a detailed study of the origin and development of English institutions, local and national, to the end of the Middle Ages. This course is especially important as a preparation for the study of law.

10. History of the English Constitution since Henry VII. *2 hrs., both semesters.* (HOWARD.)

Course 10 alternates with course 9, and is open to graduates and to advanced undergraduates. It is designed to afford a detailed study of the growth of the English Parliament and the Cabinet system. Particular attention is given to the constitutional results of the Puritan Revolution and to the existing forms of local government and administration. This course is also important as a preparation for the study of law.

[Course 10 will not be given in 1894-95.]

11. The French Revolution. *2 hrs., both semesters.* (HOWARD.)

With special reference to its causes and its constitutional experiments. Open to students having a fair knowledge of general European history.

[Course 11 will not be given in 1894-95.]

12. History of England to 1485. *2 hrs., both semesters.* (SPENCER.)

The aim is to trace political and social development, thus laying a foundation for the detailed study of English constitutional and economic history in other courses. The subject is treated in the light of the general development of western Europe, and such topics as feudalism, relations of church and state, the rise of universities, are considered in their continental connections.

Course 12 is open to all students, and may be taken by first year students instead of course 1; it is specially recommended to those desiring a general course.

13. History of England since 1485. *2 hrs., both semesters.* (SPENCER.)

The aim, like that of course 12, is to trace political and social development. The internal history of the country is traced, but the chief point of view in the last two centuries is the industrial and colonial expansion, and thus the subject is studied in its European and American relations.

[Course 13 alternates with course 12, and will not be given in 1894-95.]

14. History of the Protestant Reformation. *3 hrs., both semesters.* (SPENCER.)

This course begins with a study of the fundamental principles of the Reformation, especially as seen in Luther, Zwingli, and Calvin. The origin, principles, and growth of the various sects within Protestantism are traced. Special attention is paid to the Counter-Reformation, including the Council of Trent, the Jesuits, the Inquisition, and the Index. The economic and intellectual relations of the Protestant movement and the political and religious struggles growing out of it are traced to the close of the Thirty Years' War.

15. Constitutional History of Germany in the Middle Ages. *2 hrs., both semesters.* (SHOW.)

Open to students who have had course 2 or its equivalent. Course 15 is designed to give a general knowledge of German institutions from the earliest times to the establishment of the hereditary monarchy in the fifteenth century. Special attention will be given to the development of municipal and legal institutions, and to the growth of the imperial constitution. Lehmann's *Quellen zur deutschen Reichs und Rechtsgeschichte* will furnish the documentary materials for the course.

[Course 15 will not be given in 1894-95.]

16. The Editing and Interpretation of Sources. *1 hr., both semesters.* (M. S. BARNES.)

The work of this course is open to those who have a reading knowledge of some other language than English, and who have had courses 3 and 4, or who seem otherwise specially qualified. The work will consist in translating, with appropriate introductions and necessary notes, documents and other source-material, illustrative of special topics connected with the history of the Pacific Slope or of the Nineteenth Century. The work when done will form a permanent addition to the library. Excellent and sufficient material can be furnished to students wishing this course; collections of broadsides, documents, and memoirs are available for the student of the Nineteenth Century; for the student of the Pacific Slope, there is much rich and fresh material in the Sutro Library and the California Archives. The advantages of such a practical course are,—practice in historical German, French, Spanish, and Italian; training in accuracy; and a closer sympathetic understanding of the period studied. The following topics are some of those which may reasonably be taken up in this course:—the August and September of 1792; the Revolution of 1848 in Paris; in Venice; in Milan; the Commune of 1872: the opening of Africa; the native races of the two Californias; Spanish colonial institutions; Mexican War of Independence; the Missions of the two Californias.

17. Comparative Constitutional Law of European States. *2 hrs., both semesters.* (SPENCER.)

This begins with a study of the growth of constitutionalism, of representative democracy, and of federalism in Europe in the last century, tracing the tendencies of political development in both central and local government. The main work of the course is the comparative study of the constitutions of Germany, France, Great Britain and Ireland, and Switzerland.

18. Development of Political Theories in the Seventeenth and Eighteenth Centuries. *2 hrs., both semesters.* (SPENCER.)

After a consideration of the differences between the mediæval and the modern state and of the point of view of mediæval writers on politics, a survey will be made of the transitional ideas of the sixteenth century and of the revival of the conception of the Law of Nature. The course will consist mainly of the study of English and French political writers, especially Hooker, Hobbes, Harrington, Locke, Bossuet, Montesquieu, Rousseau, and Bentham. The point of view will be the conflict between conservative or absolutist and liberal or democratic tendencies, and the different uses made of the notions of natural law and of social compact as foundations for opposing views will be investigated. The attempt will be made carefully to trace the connection of theories with practical politics, whether as cause or as result.

[Course 18 will not be given in 1894-95.]

19. Department Seminary. *2 hrs., both semesters.* (HOWARD, SHOW, M. S. BARNES, SPENCER.)

The Seminary is designed primarily to afford a practical training in methods of historical research through the use of original materials; and it combines the advantages of a University Historical Society. The distinctive work of graduates falls mainly under direction of the Seminary. It may be elected by fourth year students in History and by others who are deemed qualified. All the instructors in the Department will attend as members and leaders. The work at the weekly sessions will consist of the presentation and discussion of papers, reports, book reviews and similar results of independent research. A record of proceedings will be made by the Seminary Secretary.

Members of the Seminary are not expected to register for course 20.

20. Thesis or Research Work. *1 or 2 hrs., each semester.*

In all courses in History, unless otherwise specified, students will be given an additional hour of credit, on presentation of a satisfactory thesis embodying the results of independent work. Permission to register for thesis work must be obtained in each case from the major professor. As a

rule, every student taking History as a major subject is required to register for thesis work; but no one should register until after consultation with the instructors in the courses which he proposes to take. In special cases permission will be given to register for two hours. When a student is taking two or more courses in History the same semester, he may select his thesis in connection with either of them. Topics for independent investigation are suggested in connection with the various courses in the Historical Department. Registration for thesis work is not intended to exempt students from such incidental reports or discussions as may be required in connection with any course.

ECONOMICS AND SOCIAL SCIENCE.

Professors WARNER and ROSS, Assistant Professor MARY ROBERTS SMITH, and Lecturer WILLOUGHBY.

1. **Elements of Economics.** *3 hrs., 1st semester.* (WARNER.)
Ely and Andrews are systematically studied. The class when large is divided into sections for recitation and discussion. Lectures by instructor will supplement the texts.
Students who take their major in this Department should begin with course 1, preferably in their second year.

2. **Economic Problems.** *3 hrs., 2d semester.* (ROSS.)
Lectures and reports. A study of the signs and causes of existing discontent; of the nature, benefits, and evils of the industrial revolution; and of the complaints of the farmer, the workingman, and the consumer. The various reforms demanded on their behalf, including land nationalization, state socialism, and collectivism, will be examined and discussed.
Courses 1 and 2 are complementary and form the best introduction to the work of the Department.

3. **Corporate Industry.** *3 hrs., 1st semester.* (WARNER.)
Lectures. A comparative and historical review of corporation law in its economic aspects. The work is designed as a preparation for the study of Railroad Problems or advanced work in the study of corporations to be announced hereafter.

4. **Transportation.** *3 hrs., 1st semester.* (ROSS.)
A review of the economic, social, and political consequences of improvements in transportation and a study of the problems of the wagon-road, the canal, the natural waterway, and the street railroad.

5. **Railroad Problems.** *3 hrs., 2d semester.* (WARNER.)
Lectures and assigned reading. This course is supplementary to either 3 or 4, but may be taken by those who have had neither. Extensive use will be made of the Hopkins' Library of railroad literature.

6. **Public Finance.** *3 hrs., 1st semester.* (ROSS.)
Lectures and recitations with Bastable as text. Much attention will be given to the revenues, expenditures, and financial experiences of American states and cities.
[Course 6 will not be given in 1894-95.]

7. **Money and Credit.** *3 hrs., 1st semester.* (ROSS.)
Lectures and recitations with Walker as text. Special study of paper money, bank issues, bimetallism, the silver question, credit agencies, monetary crises, and banking.
Courses 6 and 7 will be given in alternate years.

8. **Tariff History of the United States.** *3 hrs., 2d semester.* (ELLIOTT.)
[Course 8 will not be given in 1894-95.]

9. **Pure Economics.** *2 hrs., both semesters.* (ROSS.)
Comparative and historical study of doctrines, and examination of the theories of Menger, Wieser, Böhm-Bawerk, Clark, Patten, and others. Reports and discussions on current economic literature.
[Course 9 will not be given in 1894-95.]

10. **Advanced Economics.** *2 hrs., both semesters.* (ROSS.)
Marshall as a basis. Study of concrete phenomena with a view to ascertaining the secondary laws that amend or qualify the fundamental propositions of economics. Reports and discussions on current economic literature.

11. **Statical Sociology.** *2 hrs., 1st semester.* (ROSS.)
Lectures, with Spencer as text. Study of the growth and meaning of institutions. Analysis of contemporary society.

12. **Dynamic Sociology.** *2 hrs., 2d semester.* (ROSS.)
Lectures, with Ward as text. Study of the social forces and their direction. The nature of social progress and the forces that sustain and oppose it will be investigated with a view to ascertaining its laws.

13. **Social Pathology.** *2 hrs, 1st semester.* (WARNER.)
Lectures and assigned reading. A study of abnormal conditions and the social causes and effects of vice, crime, and pauperism.

14. Charities and Correction. *2 hrs., 2d semester.* (WARNER.)
Supplementary to course 14, being a study of social therapeutics. So far as practicable visits will be made by the class to the charitable and penal institutions of the State. Contributions to a forthcoming report on the Charities of California are made by members of this class from year to year.

15. Principles of Household Management. *2 hrs., 2d semester.* (M. R. SMITH.)
Lectures and assigned reading. A study of household finance, sanitation, dietaries, domestic labor, and kindred topics.

16. Methods of Legislating. *2 hrs., 2d semester.* (WARNER.)
A comparative view of the rules and practice of modern legislative assemblies, with special reference to the machinery of congressional and legislative action in the United States.

17. Administration in American Cities, Counties, and States. *2 hrs., 2d semester.* (WARNER.)
A comparative view of the local governments of the present time, with special reference to American practice in the administrative branches.
[Course 17 will not be given in 1894-95.]
Courses 16 and 17 are given in alternate years. Together they are designed to afford the students as clear an understanding as possible of the character and work of American politicians.

18. The Philosophy of the State. *15 lectures.* (WILLOUGHBY.)
A course based upon the writings of American and Continental publicists, dealing with the nature and origin of the State, its forms, its aims, its organization and operation, its legal character, its right to be, the scope of its powers, its relations to the People and to other States; concluding with a special treatment of the modern constitutional State, its characteristics and present tendencies.
The course will be theoretical rather than descriptive or historical, and will furnish the principles upon which modern types of political life are to be interpreted, especially that of the "Federal State."

19. Department Seminary. *2 hrs., both semesters.* (WARNER, ROSS, M. R. SMITH.)
The instructors in the Department of Economics and Social Science will meet graduates and other advanced students doing original work once a week during a session of two hours. Reports of special investigations will be made by students and others, and discussed by the Seminary.

20. Theses. In certain courses students will be given an additional hour of credit on presentation of a satisfactory thesis embodying the results of independent work. Permission to register for thesis work must be obtained in each case from the major professor. Every student having his major in this department will be expected to register for thesis work during his third and fourth years.

LAW.

Professor ABBOTT, and Non-Resident Professor HARRISON.

The Department of Law conforms in all respects to the other departments of the University. The requirements for admission are the same; the courses are open for election as major or minor subjects the same as in other departments; the same degree is granted to those who have taken Law as a major subject; in short the work is that of a regular University Department and not that of a professional school.

The ultimate aims of the department, when fully developed, will be (1) To furnish such instruction in the elementary principles of Anglo-American law as may properly form a part of the education of an American citizen; (2) To furnish such instruction in commercial law as may be adapted to the needs of those who intend to become merchants, bankers, brokers, etc., or to follow other lines of business; (3) To provide for students intending to enter the public service adequate instruction in public and international law; (4) To furnish to students of political and social science training in special branches of law related to such subjects; (5) To provide for the study of jurisprudence as a science and therewith of legal history and legal institutions; (6) To furnish to students intending to adopt law as a profession a complete and thorough course of instruction which shall fit them for practice in any of the American States or wherever the common law of England prevails.

The work, therefore, when fully developed, will include a wide range of studies: instruction will be offered in the English substantive law, including the law of persons and of personal rights, with the special limitations growing out of infancy, cov-

erture, incorporation, etc.; in the law of property and of property rights, the law of commerce and of commercial and business relations, and the special jurisdiction of the courts of equity and admiralty; in the law of procedure and evidence in all the courts; in constitutional and international law; in legal history and institutions; in legal bibliography and legal material; in the civil law, and in general and comparative jurisprudence.

In addition to the courses which will form the undergraduate work of those electing Law as a major subject, it is expected to provide fifth-year or graduate courses especially adapted to the needs of those who intend to enter upon the practice of law as a profession, thereby enabling a student to complete in five years a thorough course in law in the same way in which he is now enabled to complete a course in any other specialty. Such courses when announced will be strictly graduate courses, and will be open only to graduates of this University or other similar institutions.

Students in Law are expected to take the courses in the order given. Courses 1, 2, 3, and 4 will occupy the first year, and are to be supplemented by courses in other departments, to be selected under the advice of the professors in Law. Courses 5, 6, 7, 8, and 9 will occupy the second year in Law, and will be supplemented by courses in other departments, to be selected under the advice of the professors in Law. Otherwise any of the courses in Law are open to all students.

1. **Elementary Law.** *2 hrs., 1st semester.* (———)
This course deals with the structural elements of Anglo-American law and is intended to familiarize the student with its fundamental conceptions, principles, classifications, and relations.

2. **Contracts.** *5 hrs., 1st semester; 2 hrs., 2d semester.* (———)
This course includes: (*a*) a study of the elementary principles and conceptions of the law of contracts; (*b*) a study of a considerable number of leading and typical cases from which the student will deduce statements of principles; (*c*) incidentally, instruction and practice in methods of dealing with legal material.

3. Quasi-Contracts. *2 hrs., 2d semester.* (ABBOTT.)
This course deals with the rights and obligations which arise independently of contract or tort, but which are of the nature of one or the other, as, for example, the right to recover money paid under duress. This course also deals with the subject of selection of remedies as between actions of contract and actions of tort.

4. Torts. *3 hrs., 2d semester.* (———)
This course deals with the non-contract private law, that is, with the fundamental legal rights, other than those growing out of contract, the various wrongs by which such rights are invaded, together with the methods and limits of redress. Leading and typical cases will be studied in the same way and for the same purpose as in course 2.

5. Persons and Domestic Relations. *3 hrs., 1st semester.* (ABBOTT.)
This course includes a study of the legal relations of the family, of marriage and divorce, husband and wife, parent and child, guardian and ward, and such aspects of master and servant as are not treated under agency.

6. Criminal Law. *3 hrs., 1st semester.* (ABBOTT.)
This course deals with the law of crimes. It will include a study of the history of the criminal law, as well as of specific crimes. Considerable attention will be given to the law of strikes, conspiracies, and the criminal aspect of illegal combinations affecting labor.

7. History of Actions and the Writ Process. *1 hr., 1st semester.* (ABBOTT.)
This course is intended as an introduction to the study of pleadings, and of the development of the Common Law and Equity procedure.

8. Personal Property. *5 hrs., 2d semester.* (ABBOTT.)
a. A comprehensive course on the law of personal property, with a study of the fundamental principles of possession and ownership (2 hrs.).
b. A study of the law of Sales and Gifts *inter vivos* (3 hrs.).

9. Agency. *2 hrs., 2d semester.* (ABBOTT.)
This course will include a study of the law of Principal and Agent, Brokers, Factors, Attorneys in Law and in Fact.

10. Seminary in Politico-Legal Questions. *1 hr., 2d semester.* (ABBOTT.)
The work in this course will consist in an investigation of some special constitutional, international, and legal questions that have an important bearing on political, social, or economic problems. The course is intended to be auxiliary to the courses in History and Political Science.

11. **The Development of the Constitution.** *6 lectures.* (HARRISON.)
Genesis of the Constitution; Colonial Charters and Constitutions; the Organization of the States and their earliest Constitutions; the Confederation; the Constitutional Convention.

The following courses will be begun in 1895–96:

12. **Commercial Law.**
This course will include the main topics of the law merchant and special topics of importance in ordinary business transactions.

13. **Bailments, Carriers, Railway Law, and Interstate Commerce.**

14. **Real Property** (begun).
Tenures, Estates, and Easements will be considered in this part of the course on real property, which is intended to be comprehensive. The land tenures of California and the influence of Mexican land law will receive full treatment.

15. **Partnership.**

16. **Real Property** (continued).
Title, both *inter vivos* and by descent, and devise will be considered. With this the law of administration will be taken up, and title to personal as well as real property will be included.

17. **Equity Jurisprudence.**

18. **Important English Statutes.**
This course will deal with the passage of specific English statutes,—the occasion of their passage, and their effect on the Common Law. Also the modification and interpretation of these statutes by judicial decisions, and incidentally the relation of legislation and legal fictions and judicial decisions to the growth and change of the law will be considered.

MATHEMATICS.

Professors ALLARDICE and LITTLE, Associate Professor GREEN, Assistant Professor J. A. MILLER, and Instructor COX.

The courses in this department have been arranged to meet the wants of three classes of students—students in the departments of Engineering and Physics, students whose major subject is Mathematics, and students who, while taking their major in some other department, desire to include some Mathematics in their course. Courses 1, 2, 3, and 4 have been ar-

ranged for students in Engineering and Physics, after consultation with the professors in these departments, courses 1 and 2 forming the work for the first year and courses 3 and 4 for the second year.

For students whose major subject is Mathematics the following programme of work is recommended: In the first year courses 5 and 6, or, alternatively, course 7; in the second year, courses 8 and 9; in the third year, courses 10 and 11; while the work during the fourth year and for graduate students may be selected from the remaining courses. The advanced courses in the more modern branches of Mathematics will, for the most part, be given once in two or once in three years, and it is hoped that the advanced students will thus have the opportunity of studying the more important branches of modern Mathematics.

Students who desire to take one or more years of Mathematics as part of a liberal training are recommended to begin their work in this department with courses 5 and 6 or with one of them.

1. **Solid Geometry and Algebra.** *3 hrs., both semesters.* (GREEN, J. A. MILLER.)

In 1893-94 Wilson's *Solid Geometry* and Hall & Knight's *Higher Algebra* were used as text-books. These books will probably be used in 1894-95.

In this course a few weeks will be devoted to a discussion of some of the more important parts of Plane Geometry.

2. **Trigonometry and Co-ordinate Geometry.** *4 hrs., both semesters.* (GREEN, COX.)

Lock's *Elementary Trigonometry* and Charles Smith's *Conic Sections* will be used as text-books.

[Courses 1 and 2 constitute the first year's work for students in Engineering and Physics.]

3. **Calculus.** *5 hrs., both semesters.* (LITTLE, J. A. MILLER.)

In the year 1893-94 Rice and Johnson's *Differential and Integral Calculus* was used as a text-book. In 1894-95 Byerly's text-books will probably be used.

4. Analytical Mechanics. *3 hrs., both semesters.* (J. A. MILLER, COX.)

In 1893–94 Bowser's *Mechanics* was used as a text-book; the text-book will probably be changed in 1894–95.

Courses 3 and 4 constitute the second year's work for students in Engineering and Physics.

---

5. Geometry. *2 hrs., both semesters.* (ALLARDICE.)

This course will include a discussion of some of the more modern developments of synthetic geometry.

Open to students who have credit for Plane Geometry as an entrance subject.

6. Algebra. *3 hrs., both semesters.* (GREEN.)

In this course the methods of Chrystal's Algebra will be followed; but the subject will be presented in as elementary a form as possible. A mimeographed syllabus will be used instead of a text-book.

Open to students who have credit in Elementary Algebra as an entrance subject.

Courses 5 and 6 may be taken as the first year's work by students making Mathematics their major subject. These courses are also recommended to students whose major subject lies in some other department, but who may desire to include some mathematics in their course.

7. Solid Geometry and Algebra. *5 hrs., both semesters.* (COX.)

Wilson's *Solid Geometry* and Charles Smith's *Treatise on Algebra* will be used as text-books.

Open to students who have credit for Elementary Algebra and Plane Geometry as entrance subjects.

This course may be taken, instead of courses 5 and 6, as the first year's work, by students making Mathematics their major subject.

8. Advanced Algebra. *2 hrs., both semesters.* (ALLARDICE.)

Chrystal's *Algebra* will be used as a text-book.

8a. Trigonometry. *2 hrs., both semesters.*

This course includes analytical trigonometry and spherical trigonometry.

[Trigonometry was included in the first year's work in 1893-94, and course 8*a* will not be given in 1894-95.]

9. Co-ordinate Geometry. *3 hrs., both semesters.* (LITTLE.)

Charles Smith's *Conic Sections* will be used as a text-book.

Courses 8 and 9 form the regular work, during the second year, for students whose major subject is Mathematics.

10. Differential and Integral Calculus. *3 hrs., both semesters.* (ALLARDICE.)

Lectures on the differential and integral calculus, with applications to the theory of plane curves, on the lines of Williamson's treatises.

Students are recommended to take this course in their third year.

11. Co-ordinate Geometry. *2 hrs., both semesters.* (LITTLE.)

An advanced course in this subject, in which Salmon's *Conic Sections* will be used as a text-book.

Students are recommended to take this course in their third year.

12. Analytical Statics. *2 hrs., both semesters.* (J. A. MILLER.)

Minchin's Statics will be used as a text-book.

Students are recommended to take this course in their third or fourth year.

13. Differential Equations. *3 hrs., both semesters.* (ALLARDICE.)

Forsyth's *Differential Equations* will be used as a text-book.

14. Quaternions. *3 hrs., both semesters.* (LITTLE.)

Tait's *Quaternions* will be used as a text-book.

15. Higher Plane Curves. *2 hrs., both semesters.* (GREEN.)

Salmon's *Higher Plane Curves* will be used as a text-book.

16. Function-Theory. *2 hrs., both semesters.* (ALLARDICE.)

An introduction to the theory of functions of a complex variable. A German text-book will probably be used in this course.

17. Projective Geometry.

[Course 17 will not be given in 1894-95.]

18. Determinants and the Theory of Equations.

[Course 18 will not be given in 1894-95.]

19. Geometry of Three Dimensions.

[Course 19 will not be given in 1894-95.]

ASTRONOMY.

Associate Professor HUSSEY.

1. General Astronomy. *3 hrs., both semesters.* (HUSSEY.)

Open to all students. This course is intended to furnish a general knowledge of astronomy.

2. **Planetary Astronomy.** *2 hrs., 1st semester.* (HUSSEY.)
Open to all students. This course will treat especially of the physical characteristics and motions of the planets and their satellites. It will also include a brief account of the history of astronomy.

3. **Solar and Stellar Astronomy.** *2 hrs., 2d semester.* (HUSSEY.)
Open to all students. This course will treat of the sun, the stars, and the nebulæ. It will include the principles of spectroscopy.

4. **Photography.** *Hours to be arranged, either semester.* (HUSSEY.)
This course is intended to cover the practical details ordinarily met with in astronomical work. Open to students intending to engage in astronomical work, and to such others as may receive permission.

5. **Spherical Astronomy.** *2 hrs., 1st semester.* (HUSSEY.)
This course includes spherical astronomy and its practical applications. Spherical trigonometry will be taught in the course. A knowledge of analytic geometry is assumed.

6. **Eclipses and Occultations.** *2 hrs., 2d semester.* (HUSSEY.)
This course includes the theories of solar and lunar eclipses and of occultations. Theory will be enforced by practical examples. A knowledge of calculus and spherical astronomy is assumed.

7. **Method of Least Squares.** *2 hrs., 1st semester.* (HUSSEY.)
This course will include the theory of the combination and comparison of observations and of empirical curves. A knowledge of integral calculus is assumed.

8. **Double Stars.** *2 hrs., either semester.* (HUSSEY.)
The theory and practice of the determination of the orbits of double stars by graphical and analytical methods. A knowledge of calculus is assumed.

9. **Theoretical Astronomy.** *3, 4, or 5 hrs., either semester.* (HUSSEY.)
This course treats of the determination of the orbits of comets and planets and of the construction of ephemerides. When taken through several semesters it includes the general theories of planetary motions, including special and general perturbations. A knowledge of integral calculus is assumed.

10. **Courses at the Lick Observatory.**
With the approval of President Kellogg, Professor Holden, Director of the Lick Observatory, announces that "The Lick Observatory of the University of California extends to the Leland Stanford Junior University

the courtesy of receiving its graduates seeking one of the higher degrees, as A. M. or Ph. D., and also a limited number of special students." The courses in this University lead directly to the courses given at the Lick Observatory, and residence at the Observatory will count as residence at the University. For further information concerning these courses, students should apply to Professor Hussey.

PHYSICS.

Professors SANFORD and CARMAN, Assistant Professor TAYLOR, and Instructors STEARNS and MURPHY.

1. **Elementary Laboratory Physics.** *2 hrs., both semesters.* (SANFORD, MURPHY.)

With especial reference to Chemical Physics. Course 1 is offered in connection with laboratory course *a* and lecture course 1 in Chemistry. Intended for first year students taking Physics or Chemistry as a major.

2. **Elementary Laboratory Physics.** *3 hrs., both semesters.* (SANFORD, STEARNS.)

With especial reference to Mechanics, Heat, and Electricity. Open to students who have completed courses 1 and 2, or 5 and 6, or 7, in Mathematics.

3. **Electrical and Magnetic Measurements.** *3 hrs., both semesters.* (TAYLOR.)

Open to students having had courses 1, or 2, or equivalent. Intended for students making Physics a major or pursuing the subject in connection with general scientific work.

4. **Electrical and Magnetic Measurements.** *3 hrs., both semesters.* (CARMAN.)

Open to students having had course 2, and intended especially for engineering students.

5. **Mathematical Physics.** *2 hrs., both semesters.* (CARMAN.)

In this course the subjects offered are changed from year to year. Each year is complete in itself, but the subjects for two successive years are chosen so as to form a connected course on general theoretical physics. In 1893-94 the subject was General Mechanics; in 1894-95 the subjects will be Thermo-dynamics (first semester), and Fluid Motions and Applitions (second semester).

6. **Periodic Electric Currents.** *2 hrs., 1st semester.* (CARMAN.)

7. Chemical Physics. *2 hrs., both semesters.* (SANFORD.)
For students making Physics a major. Others will be registered for this course only by special permission.

8. General Physics. *3 hrs., both semesters.* (SANFORD.)
For students who have had courses 2 and 3, or their equivalent.

9. Investigation of Original Problems in the Laboratory. (SANFORD, CARMAN.)

GRADUATE COURSES.

Graduate courses in Physics will be arranged after consultation by the faculty of the department. In general they will be laid out along two lines, Physical-Mathematical and Physical-Chemical. A knowledge of Mathematics through Analytical Geometry and Calculus will be required before entering either of the graduate courses in Physics, and a reading knowledge of French and German is much to be desired before undertaking any advanced work in Physics.

Laboratory Fees.—A charge of from two to five dollars per semester, according to the time spent in laboratory practice, payable in advance, will be made, to cover the cost of material used in the laboratories.

CHEMISTRY.

Professor STILLMAN, Associate Professor RICHARDSON, Assistant Professor LENOX, Instructor YOUNG, and Assistant MYERS.

I. LECTURE COURSES.

1. Elementary Inorganic Chemistry. *1 hr., both semesters.* (RICHARDSON.)
Explaining and reviewing laboratory course *a*, and open, in connection with that course, to all students in the University.

2. Advanced Inorganic Chemistry. *2 hrs., both semesters.* (STILLMAN.)
Experimental lectures and reviews. Open to all students who have completed courses 1 and *a*, or an equivalent.

3. Organic Chemistry. *2 hrs., both semesters.* (RICHARDSON.)
Experimental lectures and reviews on the Chemistry of Carbon Compounds. Open to students who have completed course 2.

4. Industrial Chemistry. *2 hrs., both semesters.* (STILLMAN.)
Lectures on the processes of chemical arts and industries—fuels, acid and alkali manufacturing, sugar-making, petroleum, dyes, etc.
Open to students who have completed courses 1 and 2 and laboratory course *c*; may be taken concurrently with course 3.

5. History of Chemistry. *1 hr., 2d semester.* (RICHARDSON.)
Open to students who have completed courses 2 and 3.

6. Theories of Chemistry. *1 hr., 1st semester.* (STILLMAN.)
Selected topics. Open to students who have completed courses 2 and 3; may advantageously follow course 5.

7. Urine Analysis and Toxicology. *2 hrs., 2d semester.* (LENOX.)
In connection with laboratory courses *d* and *e*. Open to students who have completed at least one semester's work in Quantitative Analysis.

8. Advanced Organic Chemistry. *1 hr., both semesters.* (YOUNG.)
Advanced topics in Organic Chemistry, including Stereo-Chemistry. Open to students who have completed course 3.

II. LABORATORY COURSES.

a. Elementary Inorganic Chemistry. *2 afternoons, both semesters.* (RICHARDSON, YOUNG.)
Experiments in elementary Inorganic Chemistry in connection with lecture course 1.

b. Qualitative Analysis. *3 afternoons, either semester.* (LENOX.)
Open to students who have completed course *a*.

c. Preparation of Typical Carbon Compounds. *3 afternoons, 2d semester.* (RICHARDSON.)
Open to students who have completed course *b*.

d. Quantitative Analysis. *4 afternoons, both semesters.* (STILLMAN, LENOX.)
Open to students who have completed courses 2 and *b*.

e. Advanced Laboratory Work. *4 afternoons, both semesters.* (STILLMAN, RICHARDSON, LENOX.)
Considerable option will be permitted during this year as to special lines of work to be pursued. Problems in Industrial Chemistry, Organic Chemistry, Analytical Chemistry, Physical Chemistry, are among the special branches from which the advanced student may choose.
Open to students who have completed course *d*.

Students in other major courses than Chemistry, who may not be able to devote the full scheduled time to any of the above laboratory courses, may enter a less number of hours, but will receive credit only on completion of the course.

III. CHEMICAL ENGINEERING.

In recognition of an increasing field of activity for men qualified to occupy positions as superintendents and managers of manufacturing enterprises involving chemical processes, it has been decided, in co-operation with the departments of Civil Engineering and Mechanical Engineering, to offer to students the opportunity to obtain such training as will best qualify them for such positions. Experience shows the great advantage in these positions of fundamental training in principles of construction, strength of materials, steam engineering, machine designing, combined with thorough chemical training.

The degree of *Engineer* in Chemical Engineering will be conferred, upon the completion of the above outlined course in Chemistry and satisfactory courses in Mathematics, Applied Mechanics, Drawing, and Machine Designing.

It is estimated that students entering the University with that intention will be able to take the degree in one year after the baccalaureate degree. Students pursuing this course will be given the degree of A. B. in Chemistry at the end of four years.

IV. GRADUATE COURSES.

Graduate students who are candidates for the degree of Ph. D. in Chemistry will be required to pursue a course of not less than three years' work subsequent to the reception of the baccalaureate degree. This course will include advanced work in the laboratory, and study of advanced courses in Chemical theories and history of Chemistry. An original investigation embodied in the form of a printed thesis, and satisfactory to the Faculty, will also be necessary, together with such other requirements as are prescribed in the general requirements for advanced degrees.

Laboratory Fees.—A charge of *fifteen dollars* per semester, or *thirty dollars* for the course, will be made to students in course *a:* a charge of *twenty dollars* per semester will be made to students in courses *b*, *c*, *d*, and *e*. Of these charges five dollars per semester is returnable, less bills for breakage or loss of apparatus. Students registering for more than scheduled hours in these courses will be charged accordingly.

BOTANY.

GENERAL BOTANY.

Professor CAMPBELL, and Instructor SHAW.

1. **Elementary Botany.** *3 hrs., both semesters.* (CAMPBELL, DUDLEY.)

Study of types of the principal groups of plants, with lectures upon special morphology and classification. (Campbell's Elements of Structural and Systematic Botany.)

The aim of this course is to give the student a grounding in the principles of plant structure and classification, derived from a careful study in the laboratory of selected types, supplemented by such explanatory lectures as may be deemed necessary.

2. **Algæ.** *3 hrs., 1st semester.* (SHAW.)

Lectures, reading, and laboratory work upon the special morphology and classification of the Algæ.

3. **Archegoniatæ.** *hrs., 2d semester.* (CAMPBELL.)

Special morphology and classification of the Archegoniatæ. Continuation of course .

4. **Histological Methods.** *2 hrs., both semesters.* (CAMPBELL, SHAW.)

Application of microtome sectioning to the study of the morphology and development of selected types.

5. **Experimental Physiology.** *3 hrs., 2d semester.* (SHAW.)

Laboratory work with lectures and reading.

6. **Advanced Work.**

Intended especially for graduate students.

Course 1 must precede all other courses, and students making the subject a major must complete courses 1 to 5 inclusive, and also courses 2 and 3 in Systematic Botany, before graduation. Course 6 is intended

especially for graduate students, and opportunities will be given such students for carrying on special lines of work upon original problems.

Laboratory Fees—Three dollars per semester for each course.

SYSTEMATIC BOTANY.

Professor DUDLEY.

Instruction in this department chiefly relates to the Spermaphytes, their structure, affinities, and geographic distribution. The advanced work on the Fungi will also be given under its direction.

Course 1 or its equivalent is required of all students intending to graduate with Systematic Botany as a major study. It is also required as a basis for courses 2, 4, and 5. An elementary knowledge of the structure of the flowering plants is required to enter course 3.

1. Elementary Botany. *3 hrs., both semesters.* (DUDLEY, CAMPBELL.)

A study of plant types, etc. [See course 1 under General Botany.]

2. The Fungi. *5 hrs., 1st semester.* (DUDLEY.)

The laboratory work (three hours) will be devoted to morphology, development, and culture methods; the lectures to systematic relationships, with an account of economically important forms.

3. The Spermaphyta. *5 hrs., 2d semester.* (DUDLEY.)

The morphology, histology, and affinities of the principal orders of flowering plants represented on the Pacific Slope will be studied, and an acquaintance made with as many forms as possible through field and laboratory work. In connection with certain orders a series of lectures on the forest trees, including the general principles of geographic distribution of plants, will be given. (Lectures and laboratory work.)

4. The Algæ and Archegoniata.

[See courses 2 and 3 under General Botany.]

5. Advanced Work. *5 hrs., both semesters.* (DUDLEY.)

Advanced work and special investigation on the biology of the Spermaphytes and Fungi, including systematic studies.

Laboratory Fees.—Three dollars per semester for each course.

ENTOMOLOGY.

Professor COMSTOCK, aud Associate Professor KELLOGG.

The instruction in this Department is given by means of lectures, laboratory practice, and field work. In the lectures the more general questions are discussed, with the view of giving the students as broad a knowledge of the subject as is practicable in the time devoted to it. In the laboratory work especial attention is paid to the methods of investigation and to training in accurate observation.

1. **General Lecture Course.** *3 hrs., January–March.* (COMSTOCK.)

Lectures treating of the zoological position of insects; the characteristics of the orders, sub-orders, and of the more important families; the habits of insects with special reference to those species that are of economic importance; and the practical application of entomology, including discussions of insecticides, and of the various methods of controlling the ravages of insects injurious to agriculture.

2. **Introductory Laboratory Course.** *2 to 5 hrs., both semesters.* (COMSTOCK, KELLOGG.)

Laboratory and field work, including the study of the more general features of insect anatomy, the determination of genera and species, and practice in collecting and preserving specimens.

Open to students who have completed course 1 in Zoology, or its equivalent.

3. **Advanced Laboratory Course.** *2 to 5 hrs., both semesters.* (COMSTOCK, KELLOGG.)

Special work in morphology, or classification, or in working out the life-history of insects.

Open to students who have completed course 2.

4. **Morphology and Classification of the Coccidæ** (Scale insects). *3 hrs., January–March.* (COMSTOCK.)

Open only to students who have completed one semester of course 2.

5. **Seminary.**

Students in the laboratory courses will meet once a month to discuss current entomological literature, and recent advances made in the practical application of entomology. Preparation and discussion of papers by members of the Seminary.

6. Public Lectures. *Daily, 1 week in February.* (COMSTOCK.)
A course treating of the more important insects of the orchards of California. This course is given in connection with a public course on Horticulture, and other lectures of general interest. All persons interested are invited to attend these lectures.

[The courses in Entomology were not given in 1893–94.]

Laboratory Fees.—Three dollars per semester for each course.

THE ENTOMOLOGICAL COLLECTIONS.

The entomological cabinet contains specimens of the more common species of the United States. These have been determined by specialists of the various orders, and are accessible for comparison. The collection includes many sets of specimens illustrative of the metamorphoses and habits of insects. The laboratory is equipped with microscopes and other apparatus necessary for practical work in entomology.

HORTICULTURE.

Assistant Professor E. E. SMITH.

1. Applied Horticulture. *5 hrs., both semesters.* (E. E. SMITH.)
a. Definitions of horticultural terms; origin, formation, classification, and cultivation of soils; composition of plants and plant foods; fertilizers; irrigation and drainage; relations of employers and laborers; keeping of records and accounts; weeds, etc. *b.* History of economic plants, development of horticulture, originating of new varieties, variation in cultivated plants, climatic influences and effect of different soils and elevations upon plants, fruits, vegetables, etc.

2. Nursery and Fruit Culture. *5 hrs., both semesters.* (E. E. SMITH.)
a. Nursery: Germination of seeds, propagation by cuttings, etc., grafting, budding, disbudding, planting, cultivating, digging, packing nursery trees, etc. *b.* Fruit culture: Selecting location for orchards and vineyards, identifying varieties of fruits, planting trees and vines, orchard pruning, grafting and culture, thinning fruit, picking, packing, marketing, etc.

Additional courses will be offered in preserving fruit, floriculture, vegetable gardening, seed growing, landscape gardening, etc.

[The courses in Horticulture were not given in 1893–94, and will not be offered in 1894–95.]

HYGIENE AND PHYSICAL TRAINING.

Professor WOOD, Instructor MOSHER, and Assistants HETHERINGTON and MARCH.

For the physical training of students there are two buildings, Roble Gymnasium, for young women, and Encina Gymnasium, for young men. Both are temporary frame buildings, but substantially built, and are equipped with the apparatus and appliances intended for the development and training of students.

Excellent facilities for athletics have been provided. The young women have two tennis courts, paved with bituminous rock; the young men, proportioned to their greater numbers, have four courts of the same material. The athletic field of thirteen and a half acres contains, in addition to the tennis courts, a quarter-mile running track, with graded area for base-ball and field sports. Practice fields for base-ball and foot-ball are located upon adjoining grounds. A lake, half a mile long, near the University buildings, furnishes opportunities for rowing. Boating clubs have been organized and a boat-house has been built.

The work in physical training is under the supervision of the medical director, who is the professor of hygiene and physical training. All students are entitled to medical advice and treatment, except in case of protracted illness or contagious disease.

The physical measurements of the students are taken at intervals throughout the course. The information given by the physical measurements and the medical examination, including an examination of the eyes and other special sense organs, furnishes to the medical director the basis of advice to individual students as to the hygienic regimen most conducive to health and systematic development. Exercises are prescribed for the individual, directed first to the correction of physical deformities and errors in health, and then to the complete development of the student. The gymnastic work is under the constant supervision of the professor of physical training and the instructors in this department.

1. **Gymnastic Exercises.** *1 hr., both semesters.* (WOOD, MOSHER, HETHERINGTON, MARCH.)

Individual and class work, with and without apparatus.

Open to all students, under the advice of the medical director. One hour of credit will be given for systematic prescribed work in physical exercise, the three exercises a week to be taken on separate days arranged according to the work of the student.

2. **Personal Hygiene.** *2 hrs., either semester.* (WOOD.)

Open to all students. Course 2 is designed to give the student practical knowledge upon matters pertaining to the care of the health and treatment in emergencies or "First Aid to the Injured."

3. **Sanitary Science.** *2 hrs., 2d semester.* (WOOD.)

Open to students who have completed course 2. Course 3 will take up the study of public health, general hygiene, and sanitary science. Students will prepare papers upon assigned topics.

4. **School Hygiene.** *2 hrs., 1st semester.* (WOOD.)

Open only to students in the Department of Education and others who expect to teach. The subjects studied will include: Physiology and hygiene of the nervous system; personal hygiene of school children; location, architecture, and surroundings of schoolhouses; lighting, heating, ventilation, and furniture of schoolrooms; hygiene of instruction; school diseases; physical training in schools, and the examination and measurements of children.

The following courses, in addition to courses 2, 3, and 4, are designed for candidates for the degree of A. B. in Physical Training and Hygeine and for special students in this department.

[5. **General Anatomy and Physiology.** See course 1 in Physiology.]

[6. **Animal Physiology.** See course 2 in Physiology.]

7. **Applied Anatomy and Physiology.** *2 hrs., both semesters.* (WOOD.)

Course 7 takes up the study of human anatomy and physiology from the standpoint of physical training.

8. **Physical Education.** *2 hrs., 2d semester.* (WOOD.)

Course 8 includes the special physiology of exercise and bodily mechanics, history of physical training, and the study of the various "systems of physical culture."

9. **Physical Training.** *2 hrs., both semesters.* (WOOD, MOSHER, HETHERINGTON, MARCH.)

Course 9 includes individual and class exercises; use of developing and and other apparatus; calisthenics; light and heavy gymnastics; health and medical gymnastics, with and without apparatus; gymnastic and athletic games.

10. **Special Courses** of instruction and training are laid out for advanced and special students according to the needs and qualifications of each individual. Such courses include instruction and practical work in anthropometry, charting and tabulating of statistics, physical examinations, diagnosis, special tests, prescription of exercise, medical gymnastics, fitting of gymnasiums, etc. Special investigations in the laboratory and gymnasium are taken up by advanced students as rapidly as they are able to do such work. This work includes investigations into the physiology of special exercises, testing of physical conditions and specific effects of various exercises upon the nervous system, heart, and lungs, and the various bodily functions.

PHYSIOLOGY AND HISTOLOGY.

Professor JENKINS, Assistant Professor MCFARLAND, and Instructor GREENE.

UNDERGRADUATE COURSES.

1. **General Anatomy and Physiology.** *5 hrs., both semesters.* (JENKINS, MCFARLAND, GREENE.)

This course is designed to give a general view of the laws of the structure and the activities of organisms. The work will give occasion to discuss many questions of General Biology. It consists of: First, the study of the cell and its activities as shown in the unicellular organisms, in reproductive cells, and in individual cells of many tissues; second, the study of the laws and course of development, resulting in higher differentiations in structure, and specializations in function exhibited in a selected series of organisms, both animals and plants, of increasing complexity; third, the comparative study of the physiological processes of forms placed under widely different conditions. The latter part of the course is occupied with an introduction to the embryology, anatomy, and physiology of vertebrates. (Two lectures and seven and a half laboratory hours a week.)

2. **Animal Physiology.** *3 hrs., both semesters.* (JENKINS, GREENE.)

This course is to be preceded by course 1. It includes an experimental course in Physiology based upon Foster's Physiology as the text. (One lecture and five laboratory hours a week.)

3. Histology. *3 hrs., both semesters.* (McFARLAND.)
This course includes both the study of the tissues in a comparative way, and the history of their development. Open to those who have taken course 1, or its equivalent. Students with Physiology as their major are advised to take courses 2 and 3 together. (One lecture and five laboratory hours a week.)

4. Special Courses in Physiology. *2 to 5 hrs., both semesters.* (JENKINS, GREENE.)

These courses are open to those who have taken courses 1, 2, and 3. These courses will be a continuation of course 2, but along lines of more advanced study of special subjects. A special course will be arranged for each individual student. The time of each course will vary according to the exigencies of the case.

5. Special Courses in Histology. *2 to 5 hrs, both semesters.* (McFARLAND.)
These courses are open to those who have taken courses 1 and 3. Under this head a special course in Histology, Histogenesis, or in Cell Morphology, will be planned for each individual student, with the end in view of giving opportunity for a more extended study of some phase of one of these subjects, and a careful drill in the technique of the subject. The time for each course will be fixed to accord with the nature of the work.

6. Structure and Functions of the Nervous System and the Sense Organs. *3 hrs., both semesters.* (JENKINS, GREENE.)
It is desirable that students in this course should have had at least the biological training represented by course 1. (One lecture and five laboratory hours a week.)

7. Teachers' Course in General Physiology. *3 hrs., 1st semester.* (JENKINS.)
The course is arranged to give a practical illustration of the methods of the study and teaching of Physiology in the elementary schools. Students who expect to teach are received into this course on the recommendation of the Department of Education. (One lecture and five laboratory hours a week.)

8. Journal Club. Students in the advanced classes will be expected to meet once a week to discuss current literature in Physiology and Histology.

9. Seminary in Physiology and Histology. *2 hrs., both semesters.* (JENKINS, McFARLAND.)
Open to graduate students.

Candidates for the Bachelor's Degree who select Physiology and Histology as a major will be expected to take courses 1, 2, 3, and 8, and at least two semester's work of five hours each to be made up from courses 4, 5, and 6; and in addition courses 1 and *a* in Chemistry, and the first semester of Vertebrate Embryology (course 4 in Zoology).

Laboratory Fees.—Five dollars per semester.

GRADUATE COURSES.

The graduate courses in Physiology and Histology will be planned in the case of each individual student. They will include the thorough study of some of the more recent special treatises of various subjects in Histology and Physiology, and a repetition of a sufficient number of experimental investigations to give a discipline in the methods of investigation. There will be given at different times a series of advanced lectures on Physiological and Histological subjects. The graduate students will meet weekly to discuss the journals of the Department, and will participate in the work of the Seminary in Physiology and Histology. Students in this department will occupy the latter portion of their course mainly on some original research, the subject of which is determined by their previous training and their inclinations. The collateral subjects to be pursued with the major will be chosen for each candidate with reference to his particular needs.

PREPARATORY MEDICAL COURSE.

Students intending to enter on the study of medicine, are advised to take Physiology and Histology as a major subject, with Chemistry, Physics, Comparative Anatomy of the Vertebrates, and Hygiene among the collateral subjects. Such a course gives that foundation both in scientific knowledge and in skill in experimental Physiology, and in Histological and Anatomical technique, which will make it possible to accomplish the medical course of the best medical schools in a much shorter time and with much greater advantage.

ZOOLOGY.

Professor GILBERT, Assistant Professor PRICE, and Instructor THOBURN.

1. **General Zoology.** *3 hrs., both semesters.* (GILBERT, PRICE.)
A laboratory course, involving the study of representatives of the principal groups of animals, together with lectures on their structure and classification, and on the general laws of biology which they illustrate.

2. **The Vertebrates.** *2 hrs., both semesters.* (THOBURN.)
A general course in the classification of vertebrate animals, with studies in the habits and the geographical distribution of species. The course will include field excursions, and a study of the methods of collecting and preserving specimens.

3. **Comparative Anatomy of the Vertebrates.** *3 hrs., both semesters.* (GILBERT, THOBURN.)
A more detailed examination of vertebrate morphology, including dissection of representatives of the several classes of vertebrates, with comparative studies in vertebrate osteology, the nervous and circulatory systems, etc.

4. **Vertebrate Embryology.** *2 hrs., both semesters.* (PRICE.)
A comparative study of the development of the shark, salamander, chick, and rabbit. The development of the shark will be made the center of the work.

5. **Advanced Embryology.** *2 hrs., both semesters.* (PRICE.)
The work during the first semester will consist of a detailed study of the development of the nervous system, the urinogenital, or some other important system of organs. During the second semester, each student will be given some special problem, usually in the line of the verification of some piece of original work.

6. **Ichthyology.** *2 hrs., both semesters.* (GILBERT.)
A course of lectures and laboratory work, including an examination of the larger groups of fishes, with special reference to the characters on which they are based, and including practical work in the discrimination of species.

7. **Advanced Ichthyology.** *3 hrs., both semesters.* (GILBERT.)
Special problems in the morphology and classification of fishes will be set for advanced students prepared for such work.

8. Organic Evolution. *2 hrs., both semesters.* (JORDAN.)
Lectures on the origin of species, the laws of life, and the factors of organic evolution, with critical studies by the students of the chief works bearing on the subject.

The Zoological Club meets bi-weekly to discuss and record the original observations of its members. Field excursions are frequently taken, and a zoological exploration of the vicinity of Palo Alto is in progress.

Course 1 or its equivalent must precede all others, and courses 1 to 7 or their equivalents will be completed before graduation by all regular students making Zoology their major study.

Work for graduate and special students will be laid out in accordance with their individual needs and preferences.

Laboratory Fees—Five dollars per semester.

THE ZOOLOGICAL MUSEUM.

The Zoological Museum contains a very full representation of the fishes of North America, consisting of about 5000 alcoholic specimens representing about 1500 species. These include among others a valuable series of the deep-water fishes of the Pacific and large collections from the West Indies and the Sandwich Islands. During the past year large additions have been made to the collections of reptiles, birds, and mammals, special attention being given to the fauna of California and adjoining States.

Material illustrating the principal groups of invertebrates is ample for class instruction.

GEOLOGY.

Professor BRANNER, and Associate Professor J. P. SMITH.

1. Dynamic and Structural Geology. *3 hrs., 1st semester.* (BRANNER.)
Geikie's Class-book of Geology.

2. Economic Geology. *2 hrs., 2d semester.* (BRANNER.)
Lectures, with visits to mines.
Open to students who have completed course 1.

3. Topographic Geology. *5 hrs., both semesters.* (BRANNER.)
Field and laboratory work, with the construction of geologic maps, models, and sections.

Open to students who have completed course 1.

4. Special Courses of instruction and training are laid out for advanced and special students according to the needs and qualifications of each individual. Special investigations are taken up by advanced students as rapidly as it is possible for them to undertake such work advantageously. (BRANNER.)

5. Mineralogy. *2 hrs., both semesters.* (J. P. SMITH.)
a. Blowpipe analysis (first semester). *b.* Elementary Crystallography and Physical Mineralogy (second semester).

6. Advanced Mineralogy and Petrography. *5 hrs., both semesters.* (J. P. SMITH.)

a. Mathematical, Physical, and Chemical Crystallography (first semester). *b.* Descriptive Mineralogy and Petrography, with special studies of the rock-forming minerals (second semester).

Open to advanced students and graduates.

7. Paleontology. *4 hrs., both semesters.* (J. P. SMITH.)

a. Systematic Paleontology, or the history and character of organisms (first semester). *b.* Historical Geology, or the history and character of formations (second semester).

Open to students who have completed course 1.

8. Paleontology. *2 to 5 hrs., both semesters.* (J. P. SMITH.)
Original investigation of various problems in paleontology, especially of the distribution of faunas. This course will consist entirely of private work, in field and laboratory.

Open to advanced students and graduates.

Laboratory Fees.—Three dollars per semester in course 5.

MINING ENGINEERING.

1. Mining Machinery and Mill Work. *3 hrs., 2d semester.*
Course 1 assumes Mathematics 3 and 4, Civil Engineering 1 and 5, Drawing 1, Chemistry *a* and *b*, and Geology 1 and 5.

2. Assaying. *2 hrs., 2d semester.* (LENOX.)
Course 2 assumes course 1, course 2 in Physics, courses 2, 3, and 8 in Civil Engineering, courses 1, *a*, and *b* in Chemistry, and courses 1 and 2 in Geology.

3. **Metallurgy.**

4. **Ore Dressing, etc.**

5. **Mining.**

[Courses 1, 3, 4, and 5 will not be given before 1895–96.]

Laboratory Fee.—Twenty dollars in course 2.

DRAWING AND PAINTING.

Associate Professor BROWN, and Assistant Professor A. B. CLARK.

The instruction in this department is given with a view to its educational value. The aim is to give power to observe visible facts, skill to record them, intelligence to understand them, and esthetic sensibility to feel their significance and beauty. Different materials, as pencil, pen, sepia, etc., are used at different times, because each gives a peculiar kind of mental and manual discipline and helps the student to find that material which most naturally lends itself to the expression of those qualities in nature that particularly appeal to him.

The student begins with the study of the laws of perspective, of light and shade and of color, in their practical application—which, being a science, can be taught, and afterwards considers the fine art of representation, which, being art, can be "learned but not taught." Still, so far as is possible, by the study of examples and of nature and the general cultivation of the esthetic and creative faculties, art is taught. It is assumed that sensibility and knowledge and skill underlie the only valuable judgments and tastes, whether regarding things of nature or of art. Gradually, and more and more as the work advances, esthetic questions are considered and work is criticised from that side. As an aid to this, some attention is given to the literature of the subject, and, as soon as examples are procured, will be given to the study of drawings by various masters in various materials; and it is hoped, in the near future, to offer courses in Art History.

Considerable freedom is allowed advanced students as to subjects, and the materials to be used. It is not intended to give a bias toward any particular technical style, the only technical requirement being that the work shall be done on the fundamental principles of sound workmanship. For sufficiently advanced students cast and life work is provided. Landscape work is given as much attention as figure work. The training is such that scientific students can easily work into scientific illustrating, and whatever assistance in this line is practicable will be given.

In some of the courses there is indicated more work, or a greater variety, than can be taken by any one student in the time allotted. The student is to choose, with the approval of the instructor, which he will take. So far as possible each student is treated separately and is given the practice he most needs.

1. Elementary. *2 hrs., 1st semester.* (———.)

a. Methods of observation, and their application to elementary flat copying with the lead pencil, of lines, squares, circles, mathematical curves, and simple outlines of natural forms. *b.* Outlining the geometrical model. *c.* Shading the geometrical model. Memory and time sketches required from time to time throughout.

Open to all students, but arranged especially for students in the Engineering courses.

[Course 1 is not a preparation for the second semester of course 2.]

2. Elementary Drawing, Light and Shade, Still-life, and Landscape. *3 hrs., both semesters.* (A. B. CLARK.)

a. An analysis of methods of observation, with application to elementary flat copying with the lead pencil, of lines, squares, circles, mathematical curves, and simple outlines of natural forms. *b.* Outlining the geometrical model. *c.* Scientific perspective. *d.* Shading exercise, with pencil, pen, or wash. *e.* Shading geometrical model. *f.* Graded exercise in still-life drawing in light and shade, in wash, pen, or pencil, with special attention given to correct interpretation of values of local colors. *g.* Studies in line and wash. *h.* Drawing from nature—outdoors. Study of the literature of drawing. *i.* Drawing from the cast. Time and mem-

ory sketches. (Hamerton's Graphic Arts, Ruskin's Elements of Drawing, Modern Painters, and Laws of Fesole, Allonge's Charcoal Drawing, and Tyrwhitt's Pictorial Art.

Open to all students.

3. Landscape, Casts, and Life Work. *4 hrs., both semesters.* (BROWN.)

a. Drawing from nature—landscape. *b.* Casts. *c.* Time and memory drawings. *d.* Elementary study of oil painting. *e.* Drawing from life, or from nature (landscape). Oil painting in still life may be taken up if the student's power of drawing warrants it.

Open to those who have had course 2 or its equivalent.

4. Scientific Perspective. *2 hrs., 2d semester.* (A. B. CLARK.)

a. Theory of perspective and applications in assumed problems: with instruments. *b.* Use of principles of perspective in actual problems: from nature. *c.* Perspective criticism and study of drawings and photographs.

Open to students who have had or who are taking course 1 or course 2.

5. Lectures on Art. *2 hrs., 2d semester.* (BROWN.)

Open to students who have had course 2.

[Course 5 may not be given in 1894–95.]

6. Architectural Draughting. *3 hrs., both semesters.* (A. B. CLARK.)

a. Lectures on the elementary principles of Architecture. *b.* House planning and wood construction. *c.* Study of masonry in modern American architecture. *d.* Design in masonry.

Open to students who have had or who are taking course 2.

7. Drawing from Life, Head and Figure; Still Life in Color. *3 hrs., both semesters.* (BROWN.)

It is intended to arrange further courses in color, in figure work, and in landscape, as the needs of the students demand.

CIVIL ENGINEERING.

Professors MARX, WING, and HOSKINS, and Assistant Professor FISH.

I. GENERAL WORK.

1. Linear Drawing and Descriptive Geometry. *3 hrs., 1st semester, 4 hrs., 2d semester.* (MARX, FISH.)

a. Linear Drawing and Lettering. (Six hours a week, first half of first semester.)

b. Descriptive Geometry, including shades, shadows, and perspective. (Lectures and recitations two hours a week, drafting six hours; second half of first semester, and second semester.)

Course 1 *a* is open to all students, and is required of students in Engineering; 1 *b* is open to students who have completed solid geometry and 1 *a*, and is required of students in Engineering.

Applied Mechanics.

2. Applied Mechanics. *5 hrs., both semesters.* (HOSKINS.)

a. Graphic Statics. This course begins with a discussion of the general theory of complanar forces applied to a rigid body. The principles relating to the composition, resolution, and equilibrium of forces are deduced graphically, and graphic methods are given for the solution of statical problems. Then follow applications to the determination of stresses in simple framed structures, including trusses sustaining both fixed and moving loads. The determination of centroids and moments of inertia of plane areas is then taken up, but this subject is treated only so far as it has useful applications in the solution of problems in the design of structures. (Lectures and recitations three hours a week, drafting six hours; first ten weeks of first semester.)

b. Mechanics of Materials. Under this head are treated the strength and elastic properties of the ordinary materials of engineering. The main subjects covered are simple tension, compression, and shear; theory of flexure, with applications to simple and continuous beams; theory of long columns; torsion and shafts; repeated stress; sudden stress and resilience. (Lectures and recitations five hours a week for twelve weeks, following course 2 *a*.)

c. Hydrostatics and Hydraulics. This course treats of fluid pressure, the principles of fluid equilibrium, and the laws governing the flow of water through orifices, over weirs, in closed conduits, and in open channels. (Lectures and recitations five hours a week for twelve weeks, following course 2 *b*.)

Open to students who have completed courses 1, 2, 7, 8, and 9, and have taken or are taking course 4 in Mathematics; required of all students in Civil Engineering.

3. Testing of Materials. *2 hrs., 2d semester.* (HOSKINS.)

In this course each student is required to make a series of experiments, testing the strength and elastic properties of wrought iron, cast iron, steel,

timber, brick, stone, and cement. A careful record of all experiments is required of every student.

Open to all students who have taken, or are taking, course 2 *b*; required of all students in Civil Engineering.

II. SPECIAL WORK.

Topographical and Geodetic Engineering.

4. Elementary Surveying. *5 hrs., 1st semester.* (MARX.)

This course treats of surveying instruments and their adjustment, followed by the study of the various methods of surveying, and their application in actual field work. The drafting of the course includes topographical mapping and sketching. (Lectures and recitations, two hours; drafting and field work, nine hours.)

Open to students who have completed courses 1 and 2 in Mathematics and 1 *a* in Civil Engineering; required of all students in Civil Engineering.

5. Geodesy. *5 hrs., 1st semester.*

The treatment of this subject will include methods of base line and angle measurements, the adjustment of observations, geodetic levelling, and map projections. (Lectures and recitations, two hours; drafting and field work, nine hours.)

Open to students who have completed courses 1, 2, 3, and 4 in Mathematics, and courses 1 *a*, 1 *b*, and 4 in Civil Engineering; required of students who have their major in Geodetic Engineering.

[Course 5 will not be given in 1894–95.]

Railroad Engineering.

6. Economic Theory of Railroad Location. *5 hrs., 2d semester.* (MARX.)

Including Railroad Surveying, Location, and Construction. (Lectures and recitations, two hours; drafting and field work, nine hours.)

Open to students who have completed course 4 in Civil Engineering; required of all students in Civil Engineering.

7. Railroad Operation and Management. *3 hrs., 1st semester.*

Lectures and recitations.

[Course 7 will not be given in 1894–95.]

It is the intention to offer ultimately a special course in Railroad Engineering in connection with the department of Economics. The collection of railroad books in the Hopkins Library offers exceptional opportunities for research in this line.

Structural Engineering.

8. Elements of Design. *5 hrs., both semesters.* (WING.)

a. Materials of Construction. The end sought is a working knowledge of the physical properties and methods of using constructive materials, which will lead to the design of safe and economical engineering structures.

This includes a study of the mineralogy and metallurgy of iron and steel, the distribution, supply, and preservation of the various timber trees, quarrying, stone-cutting, and manufacture of masonry materials, with methods of testing and selecting materials for a given structure. (Lectures, recitations, and reports on assigned topics, two hours a week for eighteen weeks.)

b. Structural Details. This course is elementary in character, dealing with fundamental principles and applications of theory to modern practice in the design of structural details. The student is first assigned some simple structure as a roof or bridge, working drawings of which are prepared from his own measurements and the results checked. Working drawings of masonry details are next prepared, including oblique bridges and arches. The remainder of the course is confined to the design of details of joints in wood and iron. Especial attention is given to the design of riveted and pin-connected truss details. The effects of local eccentric stresses as shown by tests of full sized members are carefully considered. This work is considered a necessary preparation for the design of safe and economical structures. (Designing and drafting, nine hours a week for eighteen weeks.)

c. Structural Design. The work is intended for general application to the design of structures. Fundamental mechanical principles are applied to the determination of stresses in girders, mill building details, highway bridge trusses, and non-elastic arches.

An attempt is made to develop a theory of form for the design of structures from an artistic point of view and the design of decorative details is considered.

Designs, including bills of materials and estimates of cost, are made of a mill building, highway bridge, and stone arch. (Lectures and recitations two hours a week; designing, nine hours a week, for seventeen weeks.)

Open to students who have completed or are taking course 2; required of students in Civil Engineering.

9. Railway Bridges. *5 hrs., both semesters.* (WING.)

Open to students who have completed course 8. The stresses in as many actual structures of the modern types of bridges as possible are determined. One or more designs are made by each student to fulfill actual conditions, the parts proportioned, and true bills of material prepared as a basis for estimating the cost. Special attention is given to the study of details, shop methods, and economy in manufacture. The work in designing is largely devoted to finding out, when possible, the principles underlying present practice instead of designing according to arbitrary specifications. No text-book will be adopted, but constant use will be made of a reference library. (Two hours lectures and recitations, nine hours drafting.)

The subjects considered and their order is as follows: *a.* Location. Economic length of span, foundations, piers and abutments. *b.* Design. Kinds of trusses, loads, stresses, details, quality of material required. *c.* Manufacture. Shop methods and machinery, inspection, testing material. *d.* Erection. False works, erecting machinery.

10. Non-Simple Structures. *5 hrs., 1st semester.*

In this course will be treated such structures as swing and suspension bridges, continuous trusses, elastic arches, and building skeletons. Lectures and drafting.

[Course 10 will not be given in 1894–95.]

11. Seminary. *5 hrs., 2d semester.*

The student will be assigned some subject in the line of bridge engineering for special investigation and discussion, and involving the preparation of a thesis.

[Course 11 will not be given in 1894–95.]

Hydraulic Engineering.

12. Water Supply Engineering for Towns and Districts. *5 hrs., 1st semester.* (MARX.)

Sources of supply. Collecting and storing of water either for water supply of towns or for irrigation purposes. Settling, filtering, conducting, and delivering of water, including the study and design of all accessory works. (Three hours lectures and recitations, six hours drafting.)

Open to students who have completed courses 2 *a* and *b*, 3, 4, and 8; required of all students who take their major in Hydraulic Engineering.

13. Sanitary Engineering. *5 hrs., 2d semester.* (MARX.)

Including sewerage of towns and drainage of lands. Special attention will be given to the study of all municipal sanitary problems, such

as removal of sewage, destruction of garbage, construction, maintenance, sweeping, and repairs of streets and pavements. (Three hours lectures and recitations; six hours drafting.)

Open to students who have completed courses 2 *a* and *b*, 3, 4, 8, and 12; required of all students who take their major in Hydraulic Engineering.

III. FIFTH YEAR COURSES.

No fifth year courses in Civil Engineering will be given before 1895–96.

MECHANICAL ENGINEERING.

Professor A. W. SMITH, and Assistants BUCHANAN and PETERSON.

The following courses in Mechanical Engineering are offered. In connection with these the student may take courses in mathematics, pure and applied mechanics, chemistry, physics, and drawing, thus making up the professional part of the course, and may also elect such work from the general courses as time and preparation admit:

1. **Shop Work.** *2 or 3 hrs., each semester.* (BUCHANAN, PETERSON.

a. Woodworking and Pattern Making. (Two exercises a week, through the year.) *b*. Foundry Work. (Three exercises a week, half year.) *c*. Forge Work. (Three exercises a week, half year.) *d*. Machine-shop Work. (Three exercises a week, through the year.)

[Course 1, *b* and *d*, will not be given in 1894–95.]

Open to all students, and required of students in Mechanical Engineering.

2. **Elementary Machine Design.** *5 hrs., both semesters.* (A. W. SMITH.)

a. *Constructive Materials.* Study of the manufacture and physical qualities of material. Intended to prepare the student for selection of materials for machine parts. The drafting work consists of practice in making working drawings. (Three hours a week lectures and recitations, six hours in the drafting room, first semester.)

Open to students who have had elementary chemistry, and required of students in Mechanical Engineering.

b. Motion, Force, and Work in Machines. (Three hours a week lectures and recitations, six hours in the drafting room, second semester.)

Open to students who have completed solid geometry and who are taking course 4 in Mathematics, and required of students in Mechanical Engineering.

3. Elementary Machine Design. *4 hrs., both semesters.* (A. W. SMITH.)

a. Machine Elements. Study of fastenings, bearings, sliding surfaces, etc., of cross sectional and outline forms and of machine support. (Two hours a week, recitations and lectures, six hours in the drafting room, first semester.)

Open to students who have completed course 2, *a* and *b*, and who are taking course 2 in Civil Engineering; required of students in Mechanical Engineering.

b. Proportion of Stress Members of Machines, including steam engines and boilers. (Two hours a week, lectures and recitations, six hours in the drafting-room, second semester.)

Open to students who have completed courses 2 and 3 *a*, and who are taking course 2 in Civil Engineering; required of students in Mechanical Engineering.

4. Steam Engineering. *2 hrs., both semesters.* (———)

Mechanical theory of heat and its applications. Lectures and recitations.

Open to students who have completed Calculus and the subject of Heat in the department of Physics; required of students in Mechanical Engineering.

5. Steam Engineering. *2 hrs., both semesters.* (———)

Mechanical laboratory. Testing of engines and boilers, and experimental investigation of correlated problems.

Open to students who have completed course 4, and required of students in Mechanical Engineering.

6. Special Problems in Mechanical Engineering. *2 hrs., both semesters.* (A. W. SMITH.)

Treated by lectures, and the seminary method.

This course is intended for fourth year students, and may be either in special design, or experimental work.

No fifth year courses will be given in 1894-95.

Special Students in Mechanical Engineering should at least have completed algebra through quadratic equations, and plane geometry.

ELECTRICAL ENGINEERING.

Professor PERRINE, and Assistant OLIVETTI.

Believing that American practice has justified the separation of the Electrical Engineer from the Electrical Manufacturer, and that it has defined the Engineer to be one who is engaged upon the solution of practical problems by the aid of obtainable apparatus, the Electrical Engineering courses have been planned for the constructor of engineering works rather than for the manufacturer of machinery. While keeping this aim in view the rapid changes in the profession have not been lost sight of, and the underlying principles of correct design are dwelt upon to such an extent as will fit the Engineer to arrive at just decisions on the merits of established or proposed methods.

Before entering on the studies directly connected with this Department the student is required to be thoroughly grounded in Elementary Mathematics, Mechanics, Physics, and Chemistry; and at the same time that the Electrical Engineering courses are pursued collateral work is carried on in the practice and theory of electrical measurements and mechanical construction.

Students intending to make Electrical Engineering a major are advised to present among their entrance subjects, Advanced Algebra, Solid Geometry, Trigonometry, Physics, Drawing, French or German.

UNDERGRADUATE COURSES.

1. **Constructive Materials and Machinery.** *2 hrs., both semesters.* (PERRINE.)

a. Materials and methods of line construction for electric lighting, electric railways, power transmission, telegraphs, and telephones. (First semester.)

b. The elements of dynamo machine design, with the discussion of the principles involved as exemplified in existing American apparatus used in lighting, power transmission, mining, etc. (Second semester.)

Open to students who have completed course 2 in Physics.

2. Application and Design. *2 hrs., both semesters.* (PERRINE.)
Field, drafting, and laboratory work.
Open to students who have completed course 2 in Physics.

3. Central Station Design and Management. *2 hrs., both semesters.* (PERRINE.)
The fundamental principles of the design of central stations for electric lighting plants and railroads, writing of specifications, awarding contracts, selecting machinery, management and finance of electric plants. Lectures and recitations.
Open to students who have completed course 1.

4. Engineering Construction. *2 hrs., both semesters.* (PERRINE.)
Practice in planning electrical plants, and the solution of engineering problems. Laboratory and drafting.

5. Recent Applications of Electricity. *1 hr., both semesters.* (PERRINE.)
A free discussion of the newest applications of electricity appearing in the technical journals.

GRADUATE COURSES.

Special courses will be offered to those who have completed the undergraduate work in Electrical Engineering, and to those fitting themselves for special branches of the profession whose previous preparation is satisfactory to the Professor.

6. Dynamo Machinery Design. *2 hrs., both semesters.* (PERRINE.)
The theory and practice of the mechanical and electrical design of direct and alternating current generators and motors.

7. The Theory and Practice of the Design of Inductive Apparatus. *1 hr., both semesters.* (PERRINE.)

8. Telegraphy and Telephony. *2 hrs., both semesters.* (PERRINE.)
The design and construction of telegraph and telephone lines, apparatus, and switch boards.

9. Special Applications of Electricity. *2 hrs., both semesters.* (PERRINE.)
Apparatus for electric welding, mining, metallurgy; electrolysis in tanning, bleaching, purification of sewage, etc.

Laboratory Fees—Five dollars per year in courses 2 and 4.

MILITARY SCIENCE AND TACTICS.

Professor OYSTER.

1. **Practical Instruction.** *2 hrs., 1st semester.* (OYSTER.)
United States Infantry and Artillery drill. Regulations, small-arm target practice, and the duty of sentinels.

2. **Theoretical Instruction.** *1 hr., 1st semester.* (OYSTER.)
Drill regulations of the United States army, the preparation of reports and returns pertaining to a company, the organization and administration of the United States army, and the elementary principles governing in the art of war.

[The courses in Military Science and Tactics will not be given in 1894–95.]

UNIVERSITY EXTENSION.

The organization of University Extension societies is not undertaken by the University, but its professors are, in general, prepared to respond to any demand for courses of lectures not conflicting with University duties. They are also willing, whenever occasion arises, to undertake work in Teachers' Institutes, and to take part in lecture courses in neighboring towns.

In addition to a large number of single lectures delivered in the various cities and towns of the State, the following more extended courses of work were presented during the year 1893-94:

1. **Evolution.** Six lectures, in San Francisco; three lectures, in Los Angeles; two lectures, in San Jose. President JORDAN.

2. **Modern Poetry and Modern Thought.** Seven lectures, in Oakland. Professor HUDSON.

3. **Literature and Life.** Three lectures, in San Francisco. Professor HUDSON.

4. **Evolution in Relation to Religion and Society.** Three lectures, in Santa Clara. Professor HUDSON.

5. **Studies on Children.** Four lectures and four conferences, in Santa Rosa. Professor BARNES.

6. **Psychology of Childhood.** Five lectures and five conferences, in Oakland; three lectures and three conferences, in Stockton. Professor BARNES.

7. **Masterpieces of Greek Sculpture.** Eight lectures, in San Jose. Professor WALTER MILLER.

8. **Ethics and Literature in the Public Schools.** Five lectures, in Napa and in Red Bluff; three lectures, in Yuba City. Professor GRIGGS.

9. **The Labor Problem.** Three lectures, in Oakland; eight lectures, in San Jose. Professor ROSS.

UNIVERSITY LECTURES.

Public lectures on subjects of general interest, by members of the Faculty or by persons invited from abroad, are given in the Chapel, usually on Tuesday evenings. The following is a list of the lecturers and subjects April, 1893—April, 1894:

Professor WALTER MILLER—(1) "Greece and the Greeks of To-day"; (2) "Johann Joachim Winckelmann."

Professor MELVILLE B. ANDERSON—(1) "James Russell Lowell"; (2) "Poetry and Modern Life."

Professor HENRY A. TODD—"An Old French Romance."

Professor OLIVER P. JENKINS—"The Origin of the Senses."

Dr. FRANK B. EATON, Portland, Or.—"The Eye, from the standpoint of the Physician and of the Patient."

Mr. JOHN T. DOYLE, Menlo Park—"Early Explorations in the Santa Clara Valley."

Professor CHARLES F. KENT, University of Chicago—"The Study of the Bible."

Professor EARL BARNES—(1) "Brother Jonathan"; (2) "A Study of Children's Drawings."

Professor JOHN DICKINSON, Pasadena—"Changes of a Half-Century."

Professors WARNER, HOWARD, and ROSS—"Hard Times."

Professor WILLIAM H. HUDSON—"Science and Poetry."

Professor EDWARD A. ROSS—"The Need of Unsuccessful Men.'

President DAVID S. JORDAN—(1) "Evolution of the College Curriculum"; (2) "Standeth God Within the Shadow."

Professor EDWARD H. GRIGGS—"The Ethics of Hamlet."

Professor F. A. C. PERRINE—"Inside View of a College Settlement."

Professor AUGUSTUS T. MURRAY—"Euripedes."

Professor EMORY E. SMITH—"A Day in Africa."

The Rev. A. J. FROST, D. D., Los Angeles—"The Wonders of the Yosemite."

Mr. JOHN VANCE CHENEY, San Francisco—"A Feast of the Gods."

Purnshotam RAO TELANG, Bombay, India—"Manners and Customs of India."

Prince S. WOLKONSKY, Russia—(1) "The Parliament of Religions"; (2) "Impressions of America."

Mr. C. A. STETEFELDT, Oakland—"Education."

Mr. B. S. PAGUE, San Francisco—"Meteorology."

Miss JANE ADDAMS, Chicago—"The Hull House."

Mr. CHARLES W. REED, San Francisco—"The Municipal Government of San Francisco."

Mr. E. KNOWLTON, San Francisco—"Oliver Wendell Holmes."

Miss HARRIET HOSMER, Rome, Italy—"The Treasures of the Vatican."

Miss MARGARET SCHALLENBERGER—"Children's Rights."

Professor B. NAGARKAR, Bombay, India—"Mental and Moral Traits of the Orient and the Occident."

Professor FERNANDO SANFORD—"Artificial Rain Making."

President F. W. GUNSAULUS, Armour Institute, Chicago—"Religion in Intellectual Life."

The Rt. Rev. JOHN J. KEANE, Washington, D. C.—"The Educational Outlook."

Professor HENRY B. LATHROP—"A Prince of Liars."

THE UNIVERSITY CHAPEL.

The following are the speakers and subjects April, 1893—April, 1894, in the University Chapel, Sunday mornings, at eleven o'clock, in accordance with the provision noted on page 24:

Mrs. HENNERITTE SKELTON, San Francisco—"Living for Others."

The Rev. T. H. B. ANDERSON, Fresno—"Life and Immortality."

The Rev. THOS. FILBEN, San Francisco—"The Gospel of Christ."

The Rev. WM. RADER, Oakland—"The Power of Christianity."

The Rev. HORATIO STEBBINS, D. D., San Francisco—"The Right and Necessity of Courage in Believing."

The Rev. FRANK H. FOSTER, Pacific Theological Seminary—"Hungering and Thirsting after Righteousness."

The Rt. Rev. WM. F. NICHOLS, D. D., San Francisco—Baccalaureate Sermon.

Professor W. W. THOBURN—(1) "The First Question"; (2) "Character through Struggle"; (3) "Prayer."

The Rev. GEO. E. WALK, San Francisco—"A Good Name."

Professor JOHN DICKINSON, Pasadena—"Thinking toward the Best."

The Rev. GEO. B. HATCH, Berkeley—"Worship."

Professor M. S. CROSS, University of the Pacific—"Seeing the Invisible."

The Rev. N. H. G. FIFE, Pasadena—"Moral Heroism."

Professor WM. E. RITTER, University of California—"Spiritual Truth and Moral Truth."

The Rev. J. HERNDON GARNETT, San Jose—"The Nurture of the Inner Life."

Mr. E. LAWRENCE HUNT, New York City—"Thoroughly Furnished."

The Rev. H. T. BRIGGS, Los Gatos—"A Natural Question and a Reasonable Answer."

The Rev. GEO. WALLACE, San Mateo—"Man's Relation to God."

The Rev. Bp. DANIEL A. GOODSELL, D. D., San Francisco—"The Testing of Christianity."

Professor JOSEPH LE CONTE, University of California—"The Relation of the Church to Modern Scientific Thought."

Rabbi JACOB VOORSANGER, San Francisco—"God the Anchor of Faith."

The Rev. EDWARD B. SPALDING, D. D., San Francisco—"The Secret of a Noble Life."

The Rev. THOS. F. BURNHAM, Vallejo—"Service the true Aim of Life."

The Rev. M. C. BRIGGS, Petaluma—"What is Man that Thou art Mindful of Him?"

The Rev. LESLIE W. SPRAGUE, San Francisco—"The Essentials of Religion."

The Rev. ARTHUR CROSBY, Mt. Tamalpias—"A Well Spent Life."

The Rev. M. L. HAINES, D. D., Indianapolis, Ind.—"The Law of the Manna."

Mr. HERBERT MILLER, Stockton—"Heaven."

The Rev. W. A. BREWER, San Mateo—Easter Sermon.

UNIVERSITY ASSOCIATIONS.

THE PHILOLOGICAL ASSOCIATION.

The University Philological Association was organized September 17, 1892, for the purpose of reading and discussing

original papers. Since its organization the following papers have been presented:

Professor WALTER MILLER—"A History of the Acropolis of Athens."

Professor JULIUS GOEBEL—(1) "A Relic of German Mythology"; (2) "The German Suffix *arja*"; (3) "Hildebrand as a Teacher and as a Scholar."

Professor HENRY A. TODD—(1) "The Etymology of the French *Rotruenge*, Provençal *Retroenza*"; (2) "The Etymology of *Andare*."

Professor HENRY B. LATHROP—(1) "Romanticism and Classicism;" (2) "Studies in Wyatt and Surrey."

Professor EWALD FLÜGEL—(1) "Some Songs of the Age of Henry VII"; (2) "Life and Work of Hildebrand."

Dr. L. H. GRAU—"Some German Family and Personal Names."

Professor MARTIN W. SAMPSON—"Notes on Euphuism."

Mr. O. M. BENZON—"Pyra's *Tempel der wahren dichtkunst* and Goethe's *Zueignung*."

Professor ERNEST M. PEASE—(1) "The Origin of the Roman *Satura*"; (2) "The *Saturæ* of Ennius."

Professor JOHN E. MATZKE—(1) "The Development of Latin pretonic ŏ in French"; (2) "Diez and the Study of Romanic Philology."

Professor HENRY R. FAIRCLOUGH—"The Culex."

Professor AUGUSTUS T. MURRAY—"The Language of Comedy."

Miss BERTHA DE LAGUNA—"*Turgidus Alpinus*" (Hor. Sat. I, 10, 36).

THE SCIENCE ASSOCIATION.

The University Science Association was organized January 17, 1894. The following papers have been presented:

Professor FERNANDO SANFORD—"Speculations upon a Theory of Electricity."

Professor JOHN M. STILLMAN—"Some Modern Tendencies of Chemical Science."

Professor J. P. SMITH—"The Pacific Carboniferous Province."

Professor F. M. MCFARLAND—"Studies in the Mechanics of Development."

Professor W. J. HUSSEY—"Some Projections Observed upon Mars."

THE HOPKINS SEASIDE LABORATORY.

Professors JENKINS and GILBERT, Directors.

The Hopkins Seaside Laboratory, founded by the liberality of Mr. Timothy Hopkins, of San Francisco, has been established

as a branch of the biological work of the University, and holds its sessions during the summer months. The buildings are located at Pacific Grove, two miles west of Monterey, and stand on a low bluff immediately facing the sea. They consist of two two-story structures capable of accommodating about eighty students, and contain four general laboratories, one lecture room, and six private rooms for special investigators. They are provided with aquaria and running water, and all necessary facilities for biological study. The library and apparatus of the University are available for use in the laboratory. During the present year the Biological library has received a large number of valuable additions.

The Laboratory makes provision for three classes of students:

1. Students in the Zoological, Physiological, and Botannical Departments of the University who wish to supplement their studies with work on living marine organisms under the favorable conditions of such a station.

2. Investigators who are prepared to make researches in marine biology, for which the Pacific Coast with its almost unworked field offers exceptional attractions.

3. Teachers or others who desire to become acquainted with marine animals and plants, and to learn the practical methods of their study.

SESSION OF 1893.

The second session of the Laboratory was held during the summer of 1893, beginning June 5th. The instruction was under the supervision of Professors Jenkins and Gilbert, assisted by Messrs. McFarland, Price, and Shaw. The following were in attendance:

Howard Ayers, Ph. D., Director of the Lake Laboratory, Milwaukee, Wis.

Mrs. Frona Alexander, Academy of Science, San Francisco.

Evelyn Briggs, student in Chemistry, University.

William Briggs, student in Chemistry, University.
Stewart Daniel Briggs, A. M., graduate student in Physiology, University.
Grant Calhoun, student in Physiology, University.
C. D. Critchlow, student in Physiology, University.
Angelina Chambaud, Teacher in Santa Rosa Public Schools.
Henry P. Hammond, student in Physiology, University.
Henry Harris, student in Physiology, University.
Ernest B. Hoag, B. S., graduate student in Zoology, University.
Fred Hadley, student in Physiology, University.
H. A. Kiefer, student in Physiology, University.
Mary E. Kinney, Instructor in Physiology, State Normal School, San Jose.
George W. Luckey, student in Education, University.
F. Lillian Matson, student in Physiology, University.
Frances L. O'Meara, Teacher in Santa Rosa Public Schools.
Keinosuke Otaki, student in Zoology, University.
Stella Rose, student in Physical Training, University.
Norman B. Scofield, student in Zoology, University.
C. W. Treat, A. M., Professor of Natural Science, Napa College, Napa.
John Van Denburgh, student in Zoology, University.
Henry T. Woodward, student in Physiology, University.
Margaret Wythe, Teacher in Oakland High School.

SESSION OF 1894.

The session for 1894 will begin Tuesday, June 12th, the regular course of instruction continuing until July 21st. Investigators or advanced students may arrange to continue their work for a longer period. A circular containing detailed information concerning the work of the laboratory may be had on application to the Registrar or to the Directors.

Fees.—To investigators, the facilities of the Laboratory are offered free. Students in the University who have taken the elementary courses in Zoology, Physiology, or Botany, will pay a fee of ten dollars to cover necessary expenses. All others will be charged a fee of twenty-five dollars.

SUMMER COURSES.

MATHEMATICS.

The following courses will be offered at the University, beginning June 4th and closing July 6, 1894:

1. **Plane Geometry.** This course will consist of a rapid but thorough review of Plane Geometry, arranged to meet the needs of those who desire to take it. The theory of loci, of similar figures, and of limits, will be especially emphasized. Students will solve carefully selected lists of original exercises.

2. **Solid Geometry.** A course essentially the same as that found in Chauvenet's Geometry of Space.

3. **Elementary Algebra.** This course is intended to meet the wants of those desiring a careful review of the fundamental operations of Algebra, Factoring, and Solution of Equations. While the review must, of necessity, be rapid, the work will be rigid and systematic. A large number of illustrative exercises will be solved.

4. **Elementary Trigonometry.** Angular Analysis will constitute the major part of this course, the solution of the triangle the minor.

5. **Analytic Geometry.** An elementary but scientific treatment of co-ordinate Geometry, arranged to meet the advancement of those taking it.

6. **Elementary Algebra.** This course is intended for teachers of Elementary Algebra who desire a more thorough knowledge of the subject. (*a*) The fundamental operations will be exhibited as the direct consequences of fundamental *assumptions;* (*b*) the Theory of Symmetry; (*c*) an elementary discussion of Determinants and their application to the solution of equations.

Terms.—The tuition for each course is $10. In case there are fewer than five applicants for any one course it may not be given, but private tutors will be provided at reasonable rates. For fuller information, address John A. Miller, Stanford University, Cal.

CHEMISTRY.

Summer courses in Chemistry will be given at the University, beginning Monday, June 4th, and continuing for eight

weeks. These courses will consist mainly of laboratory work, with lectures or recitations upon general elementary Chemistry.

1. **Elementary Chemistry.** This course will be practically the same course given during the first year of Chemistry in the University. It is estimated that the student devoting his entire time, forenoons and afternoons, to this course will easily be able to complete the course, and thus be given entrance credit in Chemistry if so desired. For teachers desiring to prepare for Chemistry teaching in schools, this will afford a valuable opportunity.

2. **Advanced Courses.** Students who have had such courses as would entitle them to entrance credit in Chemistry may pursue advanced work in the laboratory in qualitative analysis, and in Organic Chemistry, or quantitative analysis. It is estimated that the equivalent of one semester's work (as scheduled) in the advanced branches can be completed.

3. **Partial Courses.** Students who find it impossible to give all their time to the Chemistry may take partial courses in the laboratory, giving half time to this work. Students in other courses than Chemistry may make arrangements to take the lectures in Elementary Chemistry if they desire.

Credit will be allowed to registered students in the University for work satisfactorily completed in the Summer Courses, if equivalent to one semester's regular work.

Fees.—The cost of the entire course will be $30, including tuition, chemicals, and reasonable breakage of apparatus. Excessive breakage or loss of apparatus will be an extra charge. Partial Course laboratory students, giving half time to laboratory work, will be charged $20 for the course. Students attending lectures only may make arrangements with the instructors.

The Summer Courses will be under the immediate direction of Mr. Stewart W. Young, assisted by Dr. H. C. Myers, though other members of the Department will take part in the instruction. All communications should be addressed to Stewart W. Young, Stanford University, Cal.

ELECTRICAL ENGINEERING.

A Summer Course will be given at the University, comprising laboratory and reading work. A charge of $15 for the course will be made.

All communications should be addressed to F. A. C. Perrine, Stanford University, Cal.

HYGIENE AND PHYSICAL TRAINING.

The Summer School of Hygiene and Physical Training will be in session at Pacific Grove, Cal., during July, 1894. The work is planned especially for teachers. The instruction will include the following:

1. Theoretical Work in Lectures.

a. Lectures on *Personal Hygiene* and discussions of methods for teaching this subject to children of different ages.

b. Lectures on *School Hygiene*; Sanitary Conditions of School Life and Hygiene of Instruction; diseases produced or aggravated by schools and their prevention.

c. Lectures on *Physical Education*, including Special Physiology and effects of exercise; discussion of the various systems of Gymnastics and the best methods of directing the exercise of school children.

d. Lectures and discussions upon the *measuring* and *testing* of children and tabulation and charting of such data.

Fee for theoretical work, $10.

2. Practical Gymnastic and Athletic Work.

a. Anthropometric examination and prescription of special exercise.

b. Instruction in School Gymnastics.

c. Such instruction in athletic sports and gymnastic games as the facilities will permit.

Fee for practical work, $10.

The School will be directed by Dr. T. D. Wood, and inquiries concerning the work may be addressed to him at the University.

Catalogue of Students.

GRADUATES.

Alexander, Monroe Hamilton, *Mayfield*, — Economics
A. B., Univ. of the Pacific, 1881; S. T. B., Boston Univ., 1891.

Anderson, Frank M., *Ashland, Or.*, — Geology
A. B., Williamette Univ., 1889.

Ashley, George Hall, *Rochester, N. Y.*, — Geology
M. E., Cornell Univ., 1889; A. M., Stanford, 1892.

Applewhite, John Campbell, *Corvallis, Or.*, — Law
B. S., Oregon State Agr. Coll., 1889.

Averett, Andrew Edgar, *San Jose*, — Economics
A. B., Stanford, 1894.

Beckman, Frank William, *Woodbridge*, — Law
B. S., San Joaquin Valley Coll., 1893.

Bell, Agnes, *Carson City, Nev.*, — Romanic Lang.
A. B., University of Nevada, 1893.

*Benzon, Oscar Magnus, *Newell, Iowa*, — German
A. B., Augustana Coll.; A. M., Stanford, 1893.

Bland, Henry Meade, *College Park*, — English
Ph. B. and Ph. D., Univ. of the Pacific.

Boardman, Elizabeth Louise, *Reno, Nev.* — Latin
A. B., Stanford, 1893.

Bridgman, Judd Noble, *Manhattan, Kan.*, — Mechanical Eng.
B. S., Kansas State Agricultural Coll., 1891.

Briggs, Stewart Daniel, *Los Gatos*, — Physiology
A. B., Stanford, 1892; A. M., 1893.

Buchanan, Richard Twells, *Logansport, Ind.*, — English
A. B., Stanford, 1893.

Butler, Charles Edgar, *Palo Alto*, — Economics
A. B., Harvard University.

*Deceased.

Clark, Arthur Bridgman, *Mayfield*, Drawing
B. Ar., Syracuse Univ., 1888; M. Ar., 1891.

Clark, George Archibald, *Palo Alto*, Latin
B. L., University of Minnesota, 1891.

Clark, Wellyn Brayton, *Castorland, N. Y.*, Mathematics
A. B., Stanford, 1893.

Cooke, Allyn Heald, *Salem, Or.*, Chemistry
A. B., Williamette Univ., 1890.

Cox, Charles Ellwood, *College Park*, Mathematics
A. B., Haverford Coll. 1880; A. M., Stanford, 1893.

Cox, Herbert Every, *Tulare*, Education
Ph. B., Univ. of the Pacific, 1882.

Cox, Lydia Shipley Bean, *San Jose*, English
A. B., Penn College.

Cummings, Minnie Ada, *Houghton, S. Dak.*, Physiology
B. S., Olivet College, 1890.

Drake, Noah Fields, *Cincinnati, Ark.*, Geology
C. E., Arkansas Industrial Univ., 1888.

Dole, Sara Elizabeth, *San Francisco*, Chemistry
A. B., Smith College, 1886.

Durand, Samuel Benjamin, *Milwaukee, Wis.*, Civil Eng.
B. C. E., Univ. of Wisconsin, 1891.

Fitzpatrick, Alfred, *Little River*, Economics
A. B., Queen's Univ., Kingston, 1889.

Foster, Frank Horton, *Woodruff, Ind.*, Mathematics
A. B., Indiana University, 1891; A. M., Stanford, 1893.

Fountain, Ethel, *Santa Rosa*, English
Ph. B., Univ. of Michigan, 1891.

Gatch, Grace, *Seattle, Wash.*, English
A. B., Univ. of Washington, 1893.

Greene, Charles Wilson, *Palo Alto*, Physiology
A. B., Stanford, 1892; A. M., 1893.

Hall, James Fremont, *Yankton, S. Dak.*, English
A. B., Yankton Coll., 1891.

Hammond, Henry Powers, *San Francisco*, Physiology
A. B., Stanford, 1893.

Hardy, Irene, *Oakland*, English
A. B., Antioch College.

Hoag, Ernest Bryant, *Evanston, Ill.*, Zoology
B. S., Northwestern University, 1892.

Hodgin, John Simeon, *Guilford College, N. C.*, Mathematics
B. S., Pacific University, 1891.

Howard, Alice Frost, *Palo Alto*, History
Ph. B., University of Nebraska.

Jenkins, William Evans, *Chicago, Ill.*, English
A. B., Indiana Univ., 1891.

Jenness, Charles Kelley, *West Epping, N. H.*, Social Science
A. B., Stanford, 1892.

Johnson, Willis Grant, *Palo Alto*, Entomology
A. B., Stanford, 1892.

Joralemon, Eugene, *Cazenovia, N. Y.*, Latin
A. B., Union College, 1877; A. M., 1880.

Kirtland, John Copeland, Jr., *Palo Alto*, Latin
A. B., Hobart College, 1890; A. M., 1893.

Lewis, Anna Lena, *Warrensburg, Mo.*, Latin
A. B., Stanford, 1894.

Lewis, Ernest Dorman, *Evansville, Ind.* History
A. B., Stanford, 1892; A. M., 1893.

Mabury, Stella Blanche, *San Jose*, English
A. B., Vassar College, 1883.

McFarland, Frank Mace, *Palo Alto*, Physiology
Ph. B., De Pauw Univ., 1889; A. M., Stanford, 1893.

Marlow, William Alonzo, *Terre Haute, Ind.*, Latin
A. B., Indiana University, 1891.

Martin, Lillie J., *San Francisco*, Psychology
A. B., Vassar College, 1880.

Means, John Harrison, *Moorefield, Ind.*, Geology
A. B., Indiana University; A. M., Stanford, 1892.

Miller, George B., *Kokomo, Ind.*, Mathematics
A. B., Stanford, 1893.

Miller, Alfred S., *Normal Square, Pa.*, Chemistry
A. M., Wichita Univ., 1890.

Myers, Henry Coffinberry, *Cleveland, O.*, Drawing
Ph. D., Strassburg Univ., 1891.

Mosher, Clelia Duel, *Palo Alto*, Physiology
A. B., Stanford, 1893.

Nowell, John A., *College Park*, — History
A. B., Stanford, 1893.

Obenauer, Olga Theophany, *East Saginaw, Mich.*, — German
A. B., Olivet College, 1888.

Olivetti, Camillo, *Turin, Italy*, — Physics
C. E., Univ. of Turin, 1891.

Pleasants, Emma Shaw, *Pottsville, Pa.*, — English
B. S., Wellesley College, 1890.

Polk, Mary, *Bruceville, Ind.*, — Ethics
A. B., Indiana Univ., 1891.

Poor, Charles Marshall, *Manchester, N. H.*, — German
A. B., Brown Univ., 1893.

Purdue, Albert Homer, *Yankeetown, Ind.*, — Geology
A. B., Stanford, 1893.

Rendtorf, Karl G., *Puetz, Germany*, — German
University of Kiel.

Richardson, Owen Dale, *Evansville, Ind.*, — Ethics
A. B., Indiana Univ., 1893.

Root, Robert Cromwell, *Ontario*, — Economics
B. S., Guilford College, 1889.

Rutter, Cloudsley, *Long Pine, Neb.*, — Zoology
B. S., Doane College, 1892.

Schmidt, John J., *Millbrae*, — German
Realschule, Metz, 1881.

Secrest, Emma, *Randolph, Kan.*, — English
B. S., Kansas State Agricultural Coll., 1890.

Shaw, Edmund Jeremiah, *Palo Alto*, — Latin
A. B., Univ. of Michigan, 1877.

Shaw, Walter Robert, *Palo Alto*, — Botany
A. B., Stanford, 1892.

Shurter, Edwin Du Bois, *Brookton, N. Y.*, — English
Ph. B., Cornell Univ., 1892.

Slayton, Helen Elizabeth, *Stowe, Vt.*, — Latin
A. B., Stanford, 1894.

Smith, Carl Schurz, *Eugene, Or.*, — Law
A. B., Stanford, 1893.

Smith, Kathryne Janette, *San Jose*, — English
Ph. B., University of the Pacific, 1888

Smith, Leigh Richmond, *San Jose*, — Latin
A. M., Princeton College, 1875.

Smith, Mary E. B. Roberts, *Palo Alto*, — Sociology
Ph. B., Cornell Univ., 1880; M. S., 1882.

Squire, John Adams, *Palo Alto*, — Latin
A. B., Harvard University, 1884.

Stearns, Herman De Clercq, *Palo Alto*, — Physics
A. B., Stanford, 1892; A. M., 1893.

Sterling, Mae Earle, *Dixon, Ill.*, — History
B. S. Northwestern Univ., 1888.

Stowell, John Matson, *Morrison, Ill.*, — Zoology
A. B., Knox College, 1891.

Vance, Jessica, S., *San Jose*, — English
Ph. B., Univ. of the Pacific, 1887.

Velasco, Abelardo, *San Francisco*, — Civil Eng.
A. B., Univ. of the South, 1892.

Washburn, Jessica Thompson, *San Jose*, — English
A. B., Stanford, 1892.

Way, Charlotte M., *Tempe, Arizona*, — Chemistry
B. S., Swarthmore College, 1888.

Wight, Edwin Buckminster, *Palo Alto*, — German
A. M., Univ. of Michigan.

Wight, John Kinlay, *Toronto, Can.*, — History
A. B., Stanford, 1893.

Woollen, Maria, *Indianapolis, Ind.*, — English
A. B., Smith College, 1893.

UNDERGRADUATES.

†Aaron, Charles Francis,	*Marysville*,	Electrical Eng.
†Abe, Frank K.,	*Miyagi, Japan*,	English
Aberdein, Carrie Blanche,	*Riverside*,	History
†Adams, John Benbow,	*Victoria, B. C.*,	Law
Adams, Maxwell,	*St. George, W. Va.*,	Chemistry
†Albee, George Brinton,	*Mayfield*,	Education
Alexander, John Edmundson,	*San Jose*,	Economics
Allabach, Lucy,	*Des Moines, Iowa*,	English
†Allaire, Pierre Alexander,	*Deming, N. M.*,	Chemistry
Allen, Harris Campbell,	*Oakland*,	Greek
Allen, Louis,	*Syracuse, N. Y.*,	Chemistry
Ames, Elsa Lovina,	*Palo Alto*,	Drawing
†Ames, John Trobridge,	*Traer, Ia.*,	Mathematics
Amesbury, Louise,	*Rockport, Me.*,	Drawing
Anfenger, Milton Louis,	*Denver, Col.*,	Law
Arnold, David Lafayette,	*Orange*,	Mathematics
†Arnold, Edward Hagerman,	*North Vernon, Ind.*,	Economics
Babcock, Elizabeth Merrill,	*Palo Alto*,	Botany
Badley, Ernest Vernon,	*Indianola, Ia.*,	Greek
Baker, Grace Amelia,	*San Diego*,	English
Baker, Shirley,	*East Oakland*,	Civil Eng.
†Baldwin, Geroge H.,	*Pasadena*,	Chemistry
Baldwin, George Porter,	*San Francisco*,	Mathematics
Ballard, Roy Page,	*Seattle, Wash.*,	History
Bancroft, George Jarvis,	*Denver, Col.*,	Mechanical Eng.
Barnes, Edward Hickey,	*Newark, O.*,	Latin
Barstow, Alfred, Jr.,	*Oakland*,	English
†Bean, Harry Joel,	*San Jose*,	Electrical Eng.
†Beedy, Josephine Caroline,	*Stanley, B. C.*,	Mathematics
Belden, Roy Keney,	*Oakland*,	Romanic Lang.
†Bell, William Nay,	*Tracy*,	Civil Eng.
Bernhard, Joseph Phillip,	*Fresno*,	History
Bertels, Chancellor Nelson,	*Wilkesbarre, Pa.*,	Mathematics
Bishop, Ethel Woodbridge,	*Alhambra*,	Latin
†Blake, Marguerite May,	*San Francisco*,	Physiology
Blake, William Ford,	*Santa Clara*,	Physiology
Bledsoe, Benjamin Franklin,	*San Bernardino*,	History
Bliven, Ralph Wagener,	*San Francisco*,	Economics
†Bloom, Mollie Saidee,	*San Jose*,	Mathematics
†Bottler, Isabella,	*Portland, Or.*,	Mathematics

Bowman, Frances Agnes,	*San Francisco,*	Greek
Boxmeyer, Charles Herbert,	*Holden, Mo.,*	Physiology
Boyd, Edith L.,	*Spokane, Wash.,*	Drawing
†Boyd, John Duncan,	*Riverside,*	Electrical Eng.
†Bradley, Le Roy,	*Ontario,*	Mathematics
Braly, Bertha Hyde,	*Fresno,*	German
Braly, Elizabeth Madison,	*Fresno,*	Drawing
†Brandt, Gerhard Johan Gilles, Jr.,	*Calistoga,*	Electrical Eng.
Breese, Llywelyn, Jr.,	*Portage, Wis.,*	Physiology
†Brewer, De Witt Clinton,	*Binghamton, N. Y.,*	Civil Eng.
Brewster, Anna Roosa,	*New York, N. Y.,*	Ethics
Briggs, William Dinsmore,	*Sacramento,*	English
Brim, Lucy May,	*Williams,*	Physiology
Bristol, Susie Brown,	*Gainesville, N. Y.,*	English
†Brooks, Franklin Vanderbilt,	*New York, N. Y.,*	Economics
†Brown, Anna May,	*Washington, D. C.,*	German
Brown, David Ewald,	*Oakland,*	Civil Eng.
Brown, Florence Villiers,	*San Jose,*	English
Brown, George Henry,	*Riverside,*	English
Brown, Hugh Henry,	*Steubenville, O.,*	Law
*Brown, Lyman Van Wickle,	*Riverside,*	Entomology
Brown, Walter Shirlaw,	*Stockton,*	Physiology
Buchanan, Bertha,	*Santa Cruz,*	Education
Buck, Harriet A.,	*Hillsdale,*	English
Buck, Rufus,	*Seattle, Wash.,*	Mining Eng.
Bullock, Bertram Nathaniel,	*Eureka,*	History
†Bumiller, Arthur William,	*Los Angeles,*	Mathematics
†Burcham, Fleming Isaiah,	*Salem, Or.,*	History
Burcham, James Taylor,	*Salem, Or.,*	History
Burke, Mary,	*Santa Cruz,*	English
Burnell, Charles Sumner Smith,	*San Francisco,*	Economics
Burnett, Arthur Hardin,	*Tulare,*	Mechanical Eng.
†Burnham, Stewart Henry,	*Vaughns, N. Y.,*	Botany
Buxton, Norman Geer,	*Johnstown, O.,*	Zoology
Caldwell, Winifred,	*Pasadena,*	Mathematics
Calhoun, Scott,	*La Conner, Wash.,*	Law
Campbell, Horace,	*College Park,*	Physiology
Campbell, Robert Willis,	*San Francisco,*	History
Campbell, William Evan,	*College Park,*	History
Canfield, William Henry,	*Kingston, N. Y.,*	Greek
Cathcart, Arthur Martin,	*Knoxville, Iowa,*	History

*In absentia.

Chadsey, Effie May,	*Palo Alto,*	Physiology
Chamberlin, Willis Perronet,	*Oakland,*	History
Champion, Louis Frederick,	*Oakland,*	Civil Eng.
Chapman, Bertha Louise,	*Oakland,*	English
Chapman, Elizabeth Corinne,	*Oakland,*	English
†Charles, Samuel Watson,	*Palo Alto,*	Law
Chase, Lewis Nathaniel,	*Riverside,*	English
†Childs, Charles Loyd,	*San Jose,*	Electrical Eng.
†Clapp, Mary Elizabeth,	*Portland, Or.,*	Latin
Clark, Grace Eleanor,	*San Jose,*	Physiology
Clarke, Elbert James,	*Grinnell, Iowa,*	Electrical Eng.
Cochran, Guy Hunt,	*Los Angeles,*	English
Cobb, Benjamin,	*Bethany,*	Latin
Cobb, Mary Marcilene,	*Ottawa, Kan.,*	Physiology
Code, Thomas K.,	*San Francisco,*	Mining Eng.
†Colcord, Stella Gladys,	*Carson, Nev.,*	French
†Collins, Mary Elizabeth,	*San Jose,*	Mathematics
Collins, Samuel Wilson,	*Graham, Mo.,*	Physics
Colliver, John Adams,	*San Bernardino,*	Physiology
†Colt, Alice Maria,	*Santa Barbara,*	English
†Coman, Wynn Smith,	*Portland, Or.,*	English
Comstock, Sarah,	*Kansas City, Mo.,*	English
Condit, Benson Clare,	*Grinnell, Iowa,*	Electrical Eng.
Condit, Clyde Ernest,	*Ironton, Ohio,*	Electrical Eng.
Conners, George Wilbert,	*Santa Rosa,*	Civil Eng.
†Connick, Harris De Haven,	*Eureka,*	Civil Eng.
Cook, Melville Thurston,	*Coffeen, Ill.,*	Botany
Coombs, Mabel,	*Marysville,*	French
Copeland, Clement Austin,	*San Diego,*	Mathematics
Copeland, Harold Townsend,	*Salem, Or.,*	Electrical Eng.
Corbert, Anita Lawrence,	*Palo Alto,*	English
Cornish, Louis Craig,	*New Bedford, Mass.,*	Ethics
Cory, Harriet,	*San Jose,*	English
Cory, Henry Manning,	*Fresno,*	Chemistry
Cory, Mabel Hyde,	*Fresno,*	History
Cory, Susanna,	*San Jose,*	English
Cotton, Aylett Rains, Jr.,	*San Francisco,*	History
†Cowen, Alice Isabel,	*San Francisco,*	German
Cox, Henry James,	*Petaluma,*	Chemistry
Cram, Charles Maurice,	*Mt. Vernon, Me.,*	English
Crane, Albert,	*Zionsville, Ind.,*	Economics
†Crane, Catharine McAlpine,	*Laurel,*	English

Crane, Edgar Willis,	*Riverside,*	Mechanical Eng.
Critchlow, Charles Dilworth,	*New Brighton, Pa.,*	Physiology
Crosett, James Haven,	*San Francisco,*	Civil Eng.
Crothers, George Edward,	*San Jose,*	History
Crow, Evelyn Gladys,	*San Jose,*	English
†Crowell, Carlena,	*San Francisco,*	Latin
Crowell, Robinson,	*San Francisco,*	Mechanical Eng.
Cuddeback, Allan Winter,	*Cuddebackville, N. Y.,*	Civil Eng.
Cullinan, Joseph Patrick,	*Santa Cruz,*	History
†Culver, George Bliss,	*Palo Alto,*	Zoology
Culver, Julia Louise,	*Palo Alto,*	English
†Culver, Richard Keith,	*Palo Alto,*	Drawing
Cuthbertson, George Washington,	*Manchester,*	Mechanical Eng.
Curtis, Alvin Henry,	*Houghton, Wash.,*	Mechanical Eng.
†Cutten, Charles Pryde,	*Eureka,*	History
Dart, Elbert Ripley,	*Rock Island, Ill.,*	Civil Eng.
†Dart, Roderick Sammis,	*Rock Island, Ill.,*	Law
Davey, Charles Wesley,	*Portland, Or.,*	History
Davies, Rees O.,	*Neath, Pa.,*	Law
Davis, Everett Leroy,	*San Jose,*	History
Davis, Grace,	*Carson, Nev.,*	Botany
†Deasy, Michael,	*Mendocino,*	History
De Haven, Lucie Gates,	*Mountain View,*	Physiology
De Laguna, Bertha,	*Oakland,*	Latin
De Laguna, Laura Frederica,	*Oakland,*	French
†De Voe, Howard Christopher,	*Montrose, Col.,*	Mathematics
Diggles, James Arthur,	*Ft. Jones,*	Civil Eng.
†Dixon, Joseph,	*Townsend, Mont.,*	Mechanical Eng.
Doane, Rennie Wilbur,	*Pasadena,*	English
Dodson, Shelby Martineau,	*Santa Clara,*	Economics
Doherty, William,	*Paterson, N. J.,*	Law
Dole, Marion Foster,	*Riverside,*	Physiology
Donald, Robert L'Amy,	*Dundee, Scotland,*	Civil Eng.
Doty, Frank Carlton,	*Hastings, Neb.,*	History
Downing, Claude Standish,	*Pleasanton,*	Civil Eng.
Downing, Paul Milton,	*Pleasanton,*	Civil Eng.
Doyle, Edmund Miller,	*Menlo Park,*	Mechanical Eng.
Drake, Robert Morris,	*Portland, Or.,*	Civil Eng.
Dray, Frank R.,	*Sacramento,*	Chemistry
Dulley, Charles John,	*Saö Paulo, Brazil,*	Geology
†Dulley, Frederick Louis,	*Saö Paulo, Brazil,*	Greek
†Dunbar, Olive Mabel,	*San Luis Obispo,*	Latin

†Durham, Robert L.,	*San Diego,*	Education
Durrell, Carleton Edgar,	*Pasadena,*	Chemical Eng.
Eaton, Oris Verta,	*Franklin, Ind.,*	Economics
Eaves, Harriet Rumsey,	*Eugene, Or.,*	Economics
Eaves, Lucile,	*Eugene, Or.,*	History
†Eberhard, Clara,	*Santa Clara,*	History
Ebert, John Edward	*Marysville,*	English
Edwards, Mary Eunice,	*Westhampton, Mass.,*	Astronomy
Ellery, Nathaniel,	*Eureka,*	Civil Eng.
†Ellis, Paul Shaffer,	*San Francisco,*	Law
Elmore, Jefferson,	*Mayfield,*	Latin
†Elmore, Margaret Hilliard,	*Mayfield,*	Physics
Ely, Le Roy D.,	*Pasadena,*	English
Emery, Arthur Lowell,	*Ithaca, N. Y.,*	Chemistry
Entler, Frank Lamond,	*Chico,*	Electrical Eng.
Ewell, Edwin Chapin,	*Sonoma,*	Law
Farmer, Elmer Elsworth,	*Vacaville,*	Electrical Eng.
†Fay, Alexandra,	*Anaheim,*	Drawing
Fernald, Charles Anselm,	*Santa Barbara,*	Physiology
Field, Charles Kellogg,	*Alameda,*	English
Field, Joel Yancy,	*Dallas, Texas,*	Economics
Fields, William Milnes, Jr.,	*Cedar Falls, Ia.,*	Mechanical Eng.
Fife, Charles Andrew,	*Pasadena,*	Chemistry
Fife, Joseph Paull,	*Pasadena,*	Economics
Fitzgerald, James Joseph,	*Stockton,*	Latin
Fletcher, Frank Dexter,	*Cazenovia, N. Y.,*	Economics
Fletcher, William Baldwin, Jr.,	*Indianapolis, Ind.,*	English
Flint, Maude,	*Mayfield,*	English
Fogg, Frederick Seydel,	*Tacoma, Wash.,*	German
Folsom, Myron Arlie,	*Edenvale,*	Law
Fong, Walter Ngon,	*San Francisco,*	Economics
†Ford, Georgiana Bishop,	*San Jose,*	Psychology
†Foss, Ashley Francis,	*Chicago, Ill.,*	Law
Foster, Benjamin Oliver,	*Washington, D. C.,*	Latin
Foster, Margaret,	*Washington, D. C.,*	Greek
†Foulkes, Edward,	*Portland, Or.,*	Architecture
Fowler, William Atwater,	*San Jacinto,*	History
†Frank, Miriam,	*Victoria, B. C.,*	English
Frankenfield, Budd Doble,	*Los Angeles,*	Mechanical Eng.
Frankenheimer, Julius B.,	*Stockton,*	Chemistry
Fraser, Alfred Parker,	*Stockton,*	English
Freas, Thomas Bruce,	*Lawrence, Kan.,*	Civil Eng.

Freeman, Blanche Mae,	*Chicago, Ill.*,	English
†Freeman, Mary,	*Stillwater, Nev.*,	English
Fry, Donald Hume,	*Arcata*,	Mechanical Eng.
†Furbush, George Ernest,	*Palo Alto*,	English
Fyffe, Harriet J.,	*Normal, Ill.*,	English
Gale, Edward Nuckols,	*Santa Rosa*,	German
†Garfield, Raymond Sheldon,	*Napa*,	Chemistry
Garretson, Sarah Jane,	*Pendleton, Ind.*,	Mathematics
Gates, John McPherson,	*Hillsboro, Or.*,	Physiology
†Gerecks, E. Louese,	*San Jose*,	English
Gibbs, Robert Adams,	*Fort Ann, N. Y.*,	Physiology
Gifford, William Pitt,	*Erie, Pa.*,	Electrical Eng.
†Gilbert, Clarence Hirons,	*Portland, Or.*,	History
Gilliam, Reuben Ferdinand,	*Columbia, S. C.*,	Law
Gilmore, Lucien Howard,	*Capron, Ill.*,	Electrical Eng.
Grabill, Clarence Alfred,	*Red Oak, Ia.*,	German
†Gray, Frank Monroe,	*San Jose*,	Economics
Gray, Harry Paul,	*Milwaukee, Wis.*,	Mechanical Eng.
Green, Edward James,	*Jamestown, N. Y.*,	History
Greenleaf, George Ravenscroft,	*San Francisco*,	Elect. Eng.
†Greenwood, Willis Adelbert,	*Orland*,	Economics
Gregg, Paul Mills,	*San Luis Obispo*,	Law
Gregory, John Munford, Jr.,	*Suisun*,	History
Grieb, Maud Louisa,	*Arroyo Grande*,	History
†Griswold, Norman McClure,	*San Francisco*,	Mathematics
Grosh, Milton David,	*San Francisco*,	Mechanical Eng.
Grove, Edward Davis,	*Oakland*,	Civil Eng.
Gunn, James Alexander, Jr.,	*Kelseyville*,	English
Guppy, Christine Mary,	*San Jose*,	Latin
Guppy, Mabel F.,	*San Jose*,	Latin
Guth, William Westly,	*San Francisco*,	History
†Gwartney, John George,	*San Jose*,	Mathematics
Hadley, Frederick Harlan,	*Tulare*,	Physiology
Hall, Myron Dorman,	*Alamo*,	Mech. Eng.
Hamilton, Ernest G.,	*Riverside*,	Civil Eng.
Hammel, Julius Cæsar,	*Elberfield, Ind.*,	Philosophy
Harrelson, William Hasting,	*Tulare*,	Civil Eng.
Harris, Henry,	*Olympia, Wash.*,	Physiology
Harper, Winnifred,	*Indianapolis, Ind.*,	English
Harter, Ralph Laban,	*San Jose*,	Civil Eng.
Hartley, Flora,	*Yankeetown, Ind.*,	Zoology
Hartmann, Frederick Adolph,	*San Francisco*,	German

†Hartshorn, Mattie Nadine,	*Conneaut, O.,*	French
Harwood, Edward Charles,	*Ontario,*	Latin
Harwood, Henry,	*Louisville, Ky.,*	Psychology
Hays, Alice Newman,	*San Diego,*	English
Hays, Eric Bligh,	*San Luis Obispo,*	Civil Eng.
Hayward, Ernest Chesney,	*Victoria, B. C.,*	Electrical Eng.
Hazzard, George Hercules,	*San Diego,*	English
†Hazzard, Harry Conwell,	*San Diego,*	Economics
Hazzard, William Clarence,	*Claquato, Wash.,*	History
Herby, Nels Jensen,	*Palo Alto,*	English
†Herold, Ada Elizabeth,	*San Jose,*	History
Herrick, Jackman,	*Washington, D. C.,*	Law
Herrick, Jane Powers,	*Sacramento,*	Latin
Herrick, Kate,	*Sacramento,*	Latin
Hervey, Annie Cabe,	*Santa Ana,*	English
Hervey, Elizabeth,	*Santa Ana,*	English
Hetherington, Clark Wilson,	*San Diego,*	Education
Hichborn, Franklin,	*Santa Clara,*	Economics
Hicks, Herbert Stephen,	*Rockford, Ill.,*	Law
Hill, Charles Caleb,	*Pasadena,*	German
Hill, Nelly May,	*Independence, Or.,*	Law
Hindry, Horace Hayes,	*Denver, Col.,*	Law
Hinsdill, Lester Jesse,	*Clarksburg,*	History
Hodgson, Caspar Wistar,	*Pasadena,*	Education
†Hofer, Theodore Robert, Jr.,	*Carson City, Nev.,*	Mechanical Eng.
Hogg, Cora E.,	*Saratoga,*	Latin
†Hogle, Charles Edward,	*Santa Ana,*	Electrical Eng.
†Holley, Carl Hiram,	*Palo Alto,*	Electrical Eng.
Hollister, John James,	*Santa Barbara,*	Mining Eng.
Holmes, Marion Estelle,	*San Jose,*	Mathematics
Holsclaw, Florence Mabel,	*Gilroy,*	Physiology
Holsclaw, Grace Evelyn,	*Gilroy,*	German
Hoover, Herbert C.,	*West Branch, Ia.,*	Geology
Hopkins, Owen Griffith,	*Sacramento,*	History
Hoshor, John Andrew,	*Tacoma, Wash.,*	Law
Hosmer, Alexander Townsend,	*Tacoma, Wash.,*	German
Howe, Agnes E.,	*Ventura,*	Botany
†Howe, George Louis,	*Brownsville, Or.,*	Chemistry
Huff, Frank Lester,	*Mountain View,*	Law
Hughes, Charles Colfax,	*Redwood City,*	Economics
†Hume, Elsie May,	*Oakland,*	English
Hunt, Harry Edward,	*Santa Ana,*	English

Huntzicker, Victor E.,	*Neillsville, Wis.*,	Law
Hyde, James Macdonald,	*Santa Clara*,	Zoology
Hyde, Walter Spalding,	*San Francisco*,	Mechanical Eng.
†Ingham, Thomas Frederick,	*Algona, Ia.*,	History
Jack, Edgar Ewing,	*Gila Bend, Ariz.*,	Horticulture
James, Laura Garner,	*San Jose*,	English
†Jarman, Albert Hutchinson,	*San Jose*,	Law
Johnson, Ernest Huston,	*Sacramento*,	Economics
Johnson, Merle De Vore,	*Oregon City, Or.*,	English
Johnson, Nello De Vore,	*Oregon City, Or.*,	English
†Johnson, Samuel Edgar,	*San Jose*,	Civil Eng.
Jones, Albert Lincoln,	*San Jose*,	Mathematics
Jones, Maud Bessie,	*Sacramento*,	Latin
†Jordan, Edith Monica,	*Palo Alto*,	History
†Jost, Fred,	*San Francisco*,	Mechanical Eng.
Kaetzel, Charles Paul,	*San Luis Obispo*,	English
†Kalenborn, Arion Siegfried,	*Tacoma, Wash.*,	Electrical Eng.
Kalenborn, Armin Victor,	*Tacoma, Wash.*,	German
†Kamiya, Takuo,	*Miyadsu, Japan*,	History
Karasek, Matthew,	*Tacoma, Wash.*,	Mechanical Eng.
Keating, John Albert,	*Muskegon, Mich.*,	Economics
Kellogg, Clara Pearle,	*Santa Rosa*,	Physiology
Kemp, William Webb,	*Palo Alto*,	Latin
Kennedy, Martin Herbert,	*Denver, Col.*,	Law
Kessinger, Frederick Ernest,	*Rome, N. Y.*,	German
Kidwell, Anna M.,	*Kansas City, Mo.*,	Botany
Kidwell, Minna A.,	*Kansas City, Mo.*,	History
Kiefer, Hugo Albert,	*Los Angeles*,	Physiology
Kimball, Edwin Boyce,	*Haywards*,	Geology
Kirkbride, Walter Harold,	*Redwood City*,	Civil Eng.
†Kittredge, Maude Chase,	*Santa Barbara*,	Drawing
Knox, Newton Booth,	*San Francisco*,	Civil Eng.
Kohler, Anna,	*St. Helena*,	Education
Kokubo, Sadanosuke,	*Nagoya, Japan*,	Greek
Labbé, Charles Henri,	*Portland, Or.*,	History
Lake, Francis Webster,	*Jamestown, N. Y.*,	History
Langford, James Terry,	*Lodi*,	Mechanical Eng.
Laughlin, Homer, Jr.,	*East Liverpool, O.*,	Chemical Eng.
Lawshé, Jay Earl,	*Tacoma, Wash.*,	History
Lay, Lucia May,	*Rosedale, Wash.*,	English
Leadbetter, Horace Martin,	*Stockton*,	Civil Eng.
Leithold, Christian Ferdinand,	*Postville, Ia.*,	Physiology

Lesley, Everett Parker,	*Santa Ana,*	Mechanical Eng.
Lewis, Abraham, Jr.,	*Gilroy,*	History
Libby, William Sumner,	*New Richmond, Wis.,*	Psychology
†Lillick, Ira Shell,	*Lawrence,*	Law
†Lincoln, George Robbins,	*White Sulphur Springs, Mont.,*	Latin
Lincoln, John Spencer,	*Santa Barbara,*	Electrical Eng.
Little, Emma Funke,	*Palo Alto,*	History
Little, Ida May,	*Dunkirk, N. Y.,*	English
Longley, Edward Roy,	*Los Angeles,*	Physiology
Longley, John Artemas,	*Mountain View,*	History
Longley, Mary Emily,	*Mountain View,*	Mathematics
Look, Samuel Miller,	*Prattsburg, N. Y.,*	Education
Lord, Fredericka Caro,	*Virginia, Nev.,*	French
Lowell, Ellen Louise,	*Calais, Me.,*	Physiology
†Luce, George Mantania,	*San Diego,*	Economics
Luckey, George W. A.,	*Riverside,*	Education
Lyle, Annie Galloway,	*San Francisco,*	English
Lyman, Edmund Renssellaer,	*Palo Alto,*	Chemistry
Lyon, Darwin Balcom,	*Red Bluff,*	Marine Eng.
Mabury, Eugenia Beatrice,	*San Jose,*	English
McCaughan, Nellie Eugenia,	*Durango, Mex.,*	English
McCollum, Jennie Frances,	*Gervais, Or.,*	History
McCord, William Hamilton,	*Farmer City, Ill.,*	Mechanical Eng.
McDaniels, John Henry,	*Tacoma, Wash.,*	English
McDonnell, Robert Emmit,	*Bozeman, Mont.,*	Civil Eng.
†McFadden, Effie Belle,	*Santa Ana,*	Botany
McFarland, Robert Daremas,	*San Jose,*	History
McGee, Van Norman,	*Bloomington, Ind.,*	Civil Eng.
McGeorge, Verne Adrian,	*Eureka,*	Mathematics
McGregor, Richard Crittenden,	*Denver, Col.,*	Zoology
McGrew, John Tarn,	*Honolulu, H. I.,*	English
McGuire, William Lewis,	*Hanford,*	Law
McIntosh, James,	*Palo Alto,*	Physics
†McIntosh, Walter Marlette,	*Los Angeles,*	Law
McLaine, William Laughlin,	*San Francisco,*	Mechanical Eng.
Maclaren, Miriam Evalyn,	*San Jose,*	English
MacLaughlin, Hilda,	*Victoria, B. C.,*	English
†McLellan, Frank Lloyd,	*Belmont,*	Mining Eng.
Mace, Lewis Sayre,	*San Jose,*	Physiology
Mackintosh, Kenneth,	*Seattle, Wash.,*	English
Magee, Chester Lea,	*San Diego,*	Physiology
Magee, Ernest De Los,	*San Diego,*	History

Manahan, Roland Harry,	*Pasadena,*	Electrical Eng.
Mann, Laura Louise,	*San Jose,*	English
†Marquam, Thomas Alfred,	*Portland, Or.,*	Electrical Eng.
†Marston, Samuel Ingersoll,	*San Francisco,*	Economics
†Martin, Emma Louise,	*Rahway, N. J.,*	English
Matthews, Frank Cameron,	*Salem, Or.,*	Economics
†Matthews, Mary Alice,	*Mayview, Mo.,*	English
Maynard, Rea Edwards,	*Los Angeles,*	Mechanical Eng.
†Mayne, William Hawthorn,	*Santa Ana,*	Marine Eng.
Mead, Mabel,	*Santa Cruz,*	English
Meany, Herbert St. John,	*Prescott, Ariz.,*	Electrical Eng.
Merrill, Samuel, Jr.,	*Indianapolis Ind.,*	English
Merritt, Alberta Lois,	*Woodland,*	English
Miller, Charles Wesley,	*Coon Rapids, Ia.,*	History
Miller, George Amos,	*Reedley,*	Economics
Mitchel, Edgar Lillian,	*Fowler,*	Education
Mitchell, Deane Prescott,	*Ashtabula, O.,*	Mining Eng.
Mitchell, Fanny Howe,	*Ashtabula, O.,*	Drawing
†Molière, Florence Elliot,	*San Francisco,*	English
Monroe, Will Seymour,	*Pasadena,*	Education
Montgomery, Alfred Cookman,	*Portland, Or.,*	Latin
*Moore, James Zachary, Jr.,	*Spokane, Wash.,*	Latin
Morgan, Grace Cecelia,	*Ontario,*	Latin
Morrison, Frank William,	*Saxton's River, Vt.,*	Latin
†Morse, Harry Wheeler,	*San Diego,*	Chemistry
Morton, Harriet Mason,	*Palo Alto,*	English
Morton, Oliver Perry,	*Palo Alto,*	Mathematics
Moulton, Seba,	*New Whatcom, Wash.,*	English
†Mount, Lucy C.,	*Mt. Ayr, Ia.,*	History
†Mumeda, Hiroshi,	*Yamagnchi, Japan,*	Economics
Murphy, Hattie Billings,	*Brentwood,*	English
Murphy, Thomas John,	*Riverside,*	History
Nagel, Walter Gilmore,	*Davenport, Ia.,*	History
Nakamura, Hatsuwo,	*Tokio, Japan,*	Chemistry
Nash, Kate Louise,	*Pasadena,*	English
Neidig, William Jonathan,	*Los Angeles,*	English
Newcomb, Lucy Helen,	*East Machias, Me.,*	Latin
Newell, James Blair,	*Santa Clara,*	Greek
Newman, Charles James,	*St. Helena,*	History
Nichols, Harriet A,	*San Francisco,*	Latin
Nicholson, Francis John,	*Victoria, B. C.,*	Physiology

* Deceased.

†Nourse, James Rittenhouse,	*Santa Ana,*	Economics
Nourse, Joseph Pomeroy,	*Santa Ana,*	Greek
O'Brien, Maurice William, Jr.	*San Jose,*	Mechanical Eng.
Offield, Lorenzo Adolphus,	*Santa Clara,*	Greek
O'Neil, Robert Joseph,	*Portland, Or.,*	Law
Orcutt, William Warren,	*Santa Paula,*	Civil Eng.
Ordway, Ruby Adaline,	*Santa Cruz,*	English
†Osborne, Henry Zenas, Jr.,	*Los Angeles,*	Civil Eng.
Osborne, Lucy Ellery,	*Watsonville,*	Mathematics
Osborne, Mary Myrtle,	*Warrensburg, Mo.,*	English
†Osborne, Sherrill Bladsell,	*Los Angeles,*	Law
Osgood, Wilfred Hudson,	*San Jose,*	Zoology
Otaki, Keinosuke,	*Tokio, Japan,*	Zoology
†Packard, Herbert Ware,	*San Diego,*	Economics
Packard, Mabel Blanch,	*San Diego,*	English
Paine, Winifred Mabel,	*Redlands,*	Botany
Palmer, Burton Murray	*Saratoga,*	Latin
Palmer, Cora Millacent,	*Saratoga,*	Economics
Parcell, Charles Henry,	*Tampa, Fla.,*	Civil Eng.
Parker, Ralph Taylor,	*Lebanon, Me.,*	Physiology
Paton, Clara,	*Otay,*	Ethics
†Payne, Rose,	*San Jose,*	English
†Peery, Jennie June,	*San Diego,*	English
†Phillips, Charlotte,	*College Park,*	Drawing
Pierson, Charles J.	*Auburn, Neb.,*	Zoology
Pillsbury, Ernest Sargent,	*Auburn,*	Physiology
Pinkham, Charles B.,	*Sacramento,*	Physiology
Pitcher, Marie Louise,	*Tacoma, Wash.,*	English
†Platt, Samuel,	*Carson City, Nev.,*	History
Platte, Frank Theodore,	*Marysville,*	Mechanical Eng.
†Polhamus, Lena,	*Coronado,*	Zoology
Pollock, Alfred Herman,	*San Francisco,*	Law
†Pomeroy, Horace,	*Oswego, Or.,*	Electrical Eng.
Pomeroy, Thomas Henry,	*Oswego, Or.,*	Mechanical Eng.
Poole, Arthur French,	*Washington, Pa.,*	Mech. Eng.
†Pope, Charles Stockton,	*Whipple, Ariz.,*	Civil Eng.
Porter, D'Arcy Alan,	*Salinas,*	Civil Eng.
Potter, Winfred White,	*San Francisco,*	English
Powell, Arthur Edward,	*Stockton,*	Civil Eng.
Pratt, Minot Tully,	*Kansas City, Mo.,*	Civil Eng.
Pressley, Lawrence Adams,	*Santa Rosa,*	English
Price, Wilson Clark,	*Jamestown, N. Y.,*	History

†Quelle, Julius A.,	*L. I. City, N. Y.*,	Civil Eng.
Raish, Ralph Rittenhouse,	*Marysville*,	English
Rankin, Orville Montgomery,	*Portland, Or.*,	Law
Ray, Charles,	*Galt*,	History
†Ray, Lillian Emeline,	*Santa Cruz*,	Physics
Ray, May Caldwell,	*Chicago, Ill.*,	Economics
Rea, Edwin Milton,	*San Jose*,	Latin
†Redon, Louis Hartnagel,	*Victoria, B. C.*,	Physiology
Reeves, Jessie Muriel,	*Seattle, Wash.*,	English
Reeves, Minnie,	*Seattle, Wash.*,	German
Reeves, William Henry, Jr.,	*Seattle, Wash.*,,	Electrical Eng.
Reichenbach, Edwin Lincoln,	*Seattle, Wash.*,	Physiology
Reilay, Luella May,	*Oakland*,	English
Reynolds, Harry B.,	*Oakland*,	Physiology
Reynolds, Jackson Eli,	*Oakland*,	History
Rice, Archer Bermingham,	*Santa Barbara*,	English
†Rice, John Bermingham,	*Santa Barbara*,	Romanic Lang.
Richards, Flora Valentine,	*College Park*,	Mathematics
Riter, George Washington,	*Logan, Utah*,	Electrical Eng.
Roach, George Humphrey,	*Portland, Or.*,	Latin
†Robinson, Harry Burdett,	*Oskaloosa, Ia.*,	Electrical Eng.
Rockhold, John Ellsworth,	*Riverside*,	Civil Eng.
†Rockwell, Harry Elijah,	*Denver, Col.*,	English
†Rood, Grace,	*San Diego*,	German
Roper, Norman Brownell,	*Santa Ana*,	Electrical Eng.
Rose, Stella,	*Pomona*,	Physical Training
Rose, Walter Malins,	*Ontario*,	History
Rosendale, Chas. Edmund Barry,	*Pacific Grove*,	History
†Ross, John Mason,	*Steubenville, O.*,	Law
†Ross, James Robert,	*Pomona*,	Economics
Rossiter, Janette Hall,	*Sheridan, Mont.*,	German
Roussel, Louise Mathilde,	*Ocean View*,	English
Roy, Roland Free,	*Virginia City, Nev.*,	Electrical Eng.
Ruddell, Almus Goar,	*San Jose*,	History
Ruddell, Frank Stallo,	*San Jose*,	History
Russell, Tracy George,	*San Francisco*,	Physiology
Rutan, Hiram Edgar,	*Mechanicsburg, O.*,	Romanic Lang.
†Ryan, Jessie A.,	*Stockton*,	German
Salisbury, Dallas Merland,	*Tacoma, Wash.*,	Mechanical Eng.
†Sampson, George Henry,	*Portland, Or.*,	Electrical Eng.
Sandwick, Richard Lanning,	*Dryden, N. Y.*,	Latin
†Saunders, Arthur Bertram,	*Woodbridge*,	Mechanical Eng.

Schallenberger, Frances Reese,	*San Jose,*	Latin
†Schallenberger, Margaret E.,	*Palo Alto,*	Education
†Schleiden, John Hidalgo,	*San Francisco,*	Mathematics
Schmidt, Alfred Francis Wm.,	*Turner, Or.,*	German
Schopbach, Lenora,	*Pasadena,*	English
Schulte, Wm. Henry Gerard,	*San Francisco,*	History
†Scott, George Winfield,	*Watertown, N. Y.,*	History
Scott, Leslie Preston,	*Honolulu, H. I.,*	History
Seale, Alvin,	*Fairmount, Ind.,*	Zoology
Searles, Dennis,	*Mojave,*	Chemical Eng.
Seybolt, Fred Lewis,	*San Jose,*	Law
†Sheafe, Charles Minette, Jr.,	*Seattle, Wash.,*	Mathematics
Shedd, Solon,	*Monmouth, Or.,*	Geology
Sheehan, John Francis, Jr.,	*San Francisco,*	History
Sheldon, Henry Davidson,	*Santa Clara,*	History
Shelley, Elsie Hjerleid,	*Berryessa,*	Physiology
Shepherd, Frank Irving,	*Kyle, O.,*	Chemistry
Simmons, Samuel Ewer,	*Sacramento,*	Chemistry
†Simons, Perry Oveitt,	*Hallowell, Kan.,*	Electrical Eng.
†Sisson, Genevra,	*Santa Cruz,*	Education
Slatten, Lillian Elizabeth,	*Portland, Or.,*	English
Sloan, James Edward,	*Mayfield,*	Greek
Smith, Alfred Augustus,	*Astoria, Or.,*	History
Smith, Harlan Clinton,	*Portland, Or.,*	English
Smith, Harold Edward,	*San Francisco,*	Greek
Smith, Lewis Howell,	*Fresno,*	Law
Smith, Rose Flora,	*Los Angeles,*	English
†Smith, Robert Kirby,	*San Jose,*	History
†Smyth, Winfield Scott, Jr.,	*Chicago, Ill.,*	Chemistry
Snow, William Freeman,	*Oakland,*	Chemistry
Snyder, Charles David,	*Fletcher, Wash.,*	Physiology
†Snyder, Ferdinand, Jr.,	*San Jacinto,*	Electrical Eng.
Soper, Harleigh Frederick,	*San Francisco,*	Physiology
Southwick, Edmund Carmel,	*Mayfield,*	Electrical Eng.
Sox, Carleton Edward,	*Albany, Or.,*	Economics
Spalding, Alfred Baker,	*Atchison, Kan.,*	Physiology
†Spear, Harold Davis,	*Boston, Mass.,*	Civil Eng.
Spencer, Rollin Herbert,	*Council Bluffs, Ia.,*	Latin
Stadtmüller, Henrietta Louise,	*San Francisco,*	English
Stafford, Walter Alfred	*Santa Ana,*	Mathematics
†Stanhope, Burton Perle,	*East Richfield, Vt.,*	Latin
Stark, Herbert Spencer,	*Cleveland, O.,*	Mining Eng.

†Steele, George Martin,	*San Miguel,*	English
Steffens, Laura,	*Sacramento,*	English
Steffens, Lottie,	*Sacramento,*	English
Stinson, Maude Evangeline,	*San Jose,*	English
Stoddard, Benjamin,	*San Bernardino,*	Physiology
†Stokes, Susie Gabriella,	*San Diego,*	Botany
Stoltenberg, Clara,	*Los Angeles,*	Education
Storey, Thomas Andrew,	*Gold Hill, Nev.,*	History
Stotlar, Albert,	*Palo Alto,*	English
†Straight, Herbert Randall,	*Bradford, Pa.,*	Economics
Stratton, George Draper,	*Riverside,*	Civil Eng.
†Strong, Will Austin,	*Los Angeles,*	Economics
Stuart, William Elder,	*an Francisco,*	Geology
Taber, Walter Cox,	*Stockton,*	Chemistry
Teggart, Frederick John,	*Belfast, Ireland,*	English
Tennyson, Howard A.	*San Jose,*	Mechanical Eng.
Terrell, Glanville,	*Louisa C. H., Va.,*	Latin
Thaxter, Harry Clinton,	*Carson City, Nev.,*	Elect. Eng.
Thomas, Benjamin,	*Palo Alto,*	Physiology
†Thomas, Chester A.,	*Sutro, Nev.,*	Electrical Eng.
Thomas, Carl Clapp,	*Pasadena,*	Electrical Eng.
†Thompson, Charles Lawrence,	*Santa Barbara,*	Economics
†Thompson, Herbert Cooper,	*Eugene, Or.,*	Latin
Thompson, Ida Gertrude,	*Santa Barbara,*	Greek
Thompson, John West,	*Redwood City,*	Mechanical Eng.
Thompson, Ralph Waldo,	*Bedford, Ia.,*	German
Timmons, Joseph H.,	*Perris,*	Economics
†Tompkins, Clara Torr,	*Paris, Ill.,*	Mathematics
†Tompkins, Zach,	*Paris, Ill.,*	Mathematics
Toombs, George,	*Modesto,*	Electrical Eng.
†Treat, Fred Aldrich,	*Salinas,*	History
Tregea, William Leonard,	*Des Moines, Ia.,*	Civil Eng.
Trumbo, Arthur Cook,	*Columbus Grove, O.,*	Economics
Trumbo, Laura Adella,	*Columbus Grove, O.,*	Physiology
Tucker, Clementine,	*Redlands,*	Latin
Tucker, Hannah Adella,	*Ontario,*	Latin
Tully, Argyle,	*Stockton,*	Economics
†Turner, Thomas Crawford,	*Livingston,*	History
Van Denburgh, John,	*Los Gatos,*	Zoology
Vanderveer, George Francis,	*Grinnell, Ia.,*	History
Van Fossen, Frank Bradley,	*Dunsmuir,*	Electrical Eng.
Vostrovsky, Clara,	*San Jose,*	Education

†Wainwright, Edith,	*San Jose,*	English
Wakefield, Edward Harlan,	*Stockton,*	History
†Walker, Charles Ashley,	*Chico,*	History
†Walker, Frank Harvey,	*San Francisco,*	Physiology
Walters, Jane Elizabeth,	*Warrensburg, Mo.,*	English
Walton, Harry Albert,	*Marysville,*	Physiology
Warren, Thomas Rawson,	*Los Angeles,*	Economics
Watson, Douglas Sloane,	*San Francisco,*	Economics
Watson, James Owen,	*Portland, Or.,*	Latin
Watson, Thomas Sidney,	*Spokane, Wash.,*	Electrical Eng.
†Weaver, Anna Frances,	*Logansport, Ind.,*	Latin
Webb, Winifred,	*Pasadena,*	English
Webster, David Hutton,	*Malone, N. Y.,*	History
†Weldon, Roy,	*Los Angeles,*	Electrical Eng.
Wells, William Bittle,	*Portland, Or.,*	English
†Welshans, Will Bemis,	*Omaha, Neb.,*	English
†Wheeler, Alice Eugenia,	*Oswego, Or.,*	English
†Whipple, Annette,	*Springfield, Ill.,*	History
White, Arthur Hain,	*Live Oak,*	Physiology
White, Paul Helb,	*Sedalia, Mo.,*	Mechanical Eng.
†Whited, Jesse Meigs,	*Wadsworth, Nev.,*	Law
Whitehouse, Louis Mein,	*Oakland,*	Civil Eng.
Whiting, Lulu Natalia,	*Mountain View,*	Latin
†Whittier, Florence Bertha,	*Riverside,*	Greek
Whittier, Ida Celia,	*Pocatello, Idaho,*	English
Widney, Martha Frances,	*Los Angeles,*	Drawing
Wight, Mary Otis,	*Palo Alto,*	German
†Wight, Walter Scott,	*San Jose,*	Latin
Wigle, Britton Day,	*Palo Alto,*	History
Wigle, Elsie Alice,	*Palo Alto,*	Botany
Wigle, Gilbert Griffin,	*Palo Alto,*	History
Wilbur, Ray Lyman,	*Riverside,*	Physiology
Wilkinson, Frank,	*Acampo,*	Civil Eng.
Willard, Hattie Mason,	*San Jose,*	Education
Williams, Fred Steele,	*Salem, Or.,*	History
†Williams, May Ida,	*Cardinal, Ont.,*	Mathematics
Williams, Thomas Henry, Jr.,	*Denver, Col.,*	Economics
†Williams, Thomas Marion,	*Duo, W. Va.,*	Law
Wilson, George Benton,	*Rialto,*	Economics
Wilson, James Fyffe,	*Mt. Palatine, Ill.,*	History
Winship, Walter Edwin,	*San Diego,*	Mathematics
Winslow, Gertrude,	*Gilroy,*	Architecture

†Wolff, Frank Carver,	*Denver, Col.*,	Chemistry
Wood, Alfred Eugene,	*Palo Alto*,	Mechanical Eng.
Wood, Ella Gertrude,	*Pasadena*,	French
Wood, Jessie Palen,	*Palo Alto*,	English
Wood, Nelle,	*Atlantic, Ia.*,	History
Wood, Oscar Baylies,	*Cupertino*,	Mechanical Eng.
Woodburn, Nettie Eudora,	*San Diego*,	English
Woodward, Henry Thomas,	*San Diego*,	Physiology
Woodworth, George Lyman,	*St. Louis, Mo.*,	Electrical Eng.
Woolrich, Arthur G.,	*San Francisco*,	Civil Eng.
Woolsey, Walter Elliott,	*Oakland*,	German
Wootten, Frank Bivens,	*Linden*,	History
Wright, Annie Louise,	*Mayfield*,	Education
Wright, Charles Frederick,	*Mayfield*,	History
Wright, Samuel Vaughan,	*San Luis Obispo*,	History
†Wyrick, Basil G,	*Angola, Ind.*,	History
Yoder, Minnie Brooks,	*Des Moines, Ia.*,	Chemistry
Young, Bertram Nelson,	*Eureka*,	Mechanical Eng.
Young, Percy A.,	*Albany, Or.*,	Economics
Younger, Charles Bruce, Jr.,	*Santa Cruz*,	English
Younger, Helen,	*Santa Cruz*,	English
Zion, Edwin Ray,	*Berkeley*,	Economics
Zumwalt, Don John,	*College Park*,	Civil Eng.
†Zumwalt, Stella M.,	*College Park*,	English

†In Partial Standing.

SPECIAL STUDENTS.

Ames, Herbert Henry,	*Traer, Ia.,*	Geology
Anderson, Elizabeth,	*Vancouver Barracks, Wash.,*	English
Andrade, Frank,	*Honolulu, H. I.,*	Civil Eng.
Ashton, Narcissa Jane,	*Menlo Park,*	English
Atherton, Albert Warren,	*San Diego,*	Education
Ayres, Mary Stevens,	*Palo Alto,*	Physical Training
Bailey, Harvey Russell,	*Wynola,*	Mining Eng.
Bailey, William,	*Livermore,*	Latin
Barnes, Adda Margaret,	*Martville, N. Y.,*	Physiology
Barnett, John Felix,	*Ukiah,*	History
Barnhart, Glenn Cobb,	*San Jose,*	History
Beard, Lottie Electa,	*Mountain View,*	Drawing
Beedy, Louis Samuel,	*Stanley, B. C.,*	Latin
Bell, James Warren,	*Visalia,*	History
Benson, Henry Wilson,	*Kelseyville,*	Electrical Eng.
Berry, Thomas Franklin,	*Wabash, Ind.,*	Education
Bothwell, J. Lewis,	*San Jose,*	Archæology
Boutelle, Harry Moss,	*Fort Custer, Mont.,*	Mechanical Eng.
Brewer, Adalein Whipple,	*San Mateo,*	English
Bryant, Emma Frances,	*The Palms,*	English
Bunker, Charles Emmons,	*Newman,*	Mechanical Eng.
Burch, Lily Virginia,	*Washington, D. C.,*	Education
Burke, Daniel Augustus,	*Cambridge, Mass.,*	Law
Buttleman, Frederick W.	*Marysville,*	Civil Eng.
Button, Matts Ralza,	*Colton,*	Law
Campbell, Claude Chamberlain,	*Los Angeles,*	Electrical Eng.
Campbell, George August,	*Oakland,*	Mechanical Eng.
Campbell, Luther,	*Warrenton, Or.,*	History
Carpenter, Edward Emery,	*San Luis Obispo,*	Civil Eng.
Carter, Thomas Newton,	*Irvington,*	Electrical Eng.
Chapin, Alice Elma,	*San Jose,*	Physiology
Chapin, John Endicott,	*San Jose,*	Chemistry
Clapp, Horace Taylor,	*Manchester, N. H.,*	Law
Clark, Grace Birge,	*Mayfield,*	English
Clayton, Edgar Oscar,	*Vacaville,*	Economics
Connon, George William,	*Aberdeen, Scotland,*	Mechanical Eng.
Cooper, John Hill,	*Campbell,*	Chemistry
Corbin, Elisha Lockhart,	*Union, Or.,*	Electrical Eng.
Corcoran, Edward,	*Vallejo,*	Civil Eng.

Corneille, Leon Albert,	*Reims, France,*	Electrical Eng.
Curtis, Albert Roscol,	*Santa Clara,*	Law
Cushman, Ada Douglas,	*Palo Alto,*	Education
Cushman, Florence,	*Palo Alto,*	English
Daniels, Alvin Bronson,	*Denver, Col.,*	Chemistry
Darwick, Lauritz E.,	*Seattle, Wash.,*	Electrical Eng.
Davis, Arthur Eugene,	*San Francisco,*	Civil Eng.
DeHart, Will Wallace,	*Carthage, Ill.,*	History
Desimone, Joseph Antony,	*San Jose,*	History
De Wolfe, Herbert Nash,	*Tacoma, Wash.,*	History
Dicks, John William Duncan,	*Natchez, Miss.,*	Civil Eng.
Dickson, James McCurdy,	*Ferndale,*	Chemistry
Diehl, Christopher B.,	*Salt Lake City, Utah,*	History
Drathen, Claus von,	*Holstein, Germany,*	Economics
Dudgeon, Frances,	*Palo Alto,*	Drawing
Dulley, Polly Beitler,	*Saö Paulo, Brazil,*	Philosophy
Duncan, William Wilson,	*Arroyo Grande,*	Mechanical Eng.
Dyer, Hugh Thomas,	*Alvarado,*	Chemistry
Eckley, Carroll Orrin,	*Brandon, Vt.,*	Mechanical Eng.
Edwards, Ada,	*Indianapolis, Ind.,*	Physical Training
Elsom, Wright, Jr.,	*Oak Park, Ill.,*	Horticulture
Fickert, Charles Marron,	*Tehachipa,*	Civil Eng.
Ford, Cornelia P.,	*San Jose,*	Botany
Forrest, Melva Naomi,	*Chehalis, Wash.,*	History
Freyschlag, Cora Emma,	*San Jose,*	Drawing
Frost, Paul Rich,	*San Bernardino,*	Law
Gardner, George Montgomery,	*Carson, Nev.,*	Physiology
Gates, Mary Julia,	*Mountain View,*	Geology
Geary, Warren Floramond,	*Santa Rosa,*	Botany
Glass, Albert Gibson,	*Nelson,*	Electrical Eng.
Glover, Irma Agnes,	*Minneapolis, Minn.,*	French
Gould, Carl Porter,	*Pomona,*	Civil Eng.
Griswold, May,	*Los Angeles,*	Latin
Grueningen, Hermann von,	*Three Rivers,*	Economics
Hall, Minnie Malvina,	*Palo Alto,*	History
Hamilton, Parnie Olive,	*Westley,*	German
Hargreaves, George,	*Bronxville, N. Y.,*	Electrical Eng.
Harper, Ida A.,	*Indianapolis, Ind.,*	French
Harrison, Ella,	*Carthage, Mo.,*	English
Harrison, Ellartina Clara,	*Santa Rosa,*	Education
Harrison, Lewis Gooding,	*Los Angeles,*	Chemistry
Harvey, Frederic Estabrook,	*Napa,*	Electrical Eng.

Haskell, Alice Lee,	*San Jose,*	Education
Hawley, Hattie Hand,	*Fresno,*	German
Hazzard, Lou J.,	*San Diego,*	English
Henne, Chris,	*Los Angeles,*	Mechanical Eng.
Henry, Lillian May,	*Hollister,*	English
Herrold, George Herbert,	*San Jose,*	Civil Eng.
Hill, George Rowland,	*Poway,*	History
Holly, Theodora H.	*Palo Alto,*	Drawing
Holt, Mary,	*Holt, Ky.,*	English
Hoover, Oliver Stanton,	*Cedron, O.,*	Civil Eng.
Howell, John Samuel,	*Hopeland,*	Mathematics
Howes, Nellie,	*San Jose,*	Drawing
Howse, Emma Ellen,	*Palo Alto,*	History
Hudson, Robert Logan,	*Garey,*	Drawing
Hughes, Edward,	*Brookville, Ind.,*	Physiology
Hulme, Edward Maslin,	*Portland, Or.,*	English
Husted, William Henry,	*Williams,*	Mechanical Eng.
Irwin, William Henry,	*Winchendon, Mass.,*	Mathematics
Jack, Francis Joseph,	*Decatur, Ill.,*	Botany
James, Edwin,	*Paso Robles,*	Civil Eng.
James, H. Jennie,	*Palo Alto,*	Education
Jansen, Emil,	*San Francisco,*	Mechanical Eng.
Johnston, Howard Charles,	*Belle Centre, O.,*	Electrical Eng.
Johnston, William Lee,	*Palo Alto,*	Mechanical Eng.
Jokisch, Harry J.,	*Bluff Springs, Ill.,*	Education
Kaufman, Adolph G.,	*Olympia, Wash.,*	Electrical Eng.
Kendall, Arthur Porter,	*Petaluma,*	Greek
Kiernan, Nelly M.,	*San Jose,*	Ethics
Kimball, Dexter Simpson,	*Fort Gamble, Wash.,*	Mech'l Eng.
Kingore, Mary,	*Los Angeles,*	English
Kingore, Miller H.,	*Los Angeles,*	English
Kirk, Robert Clifford,	*St. Paul, Minn.,*	Electrical Eng.
Kirkpatrick, Christine May,	*San Jose,*	Education
Kirkpatrick, Marjorie Alexandra,	*Redwood City,*	English
Kitzmiller, Wakefall,	*Watauga Valley, Tenn.,*	Law
Klenck, Virginia Nason,	*San Francisco,*	Education
Knowles, William Andrew, Jr.,	*Oakland,*	Architecture
Köhler, Frederick William,	*St. Helena,*	Chemistry
Kubosawa, Usaku J.,	*Yechigo, Japan,*	Drawing
Langille, Herbert Bamford,	*Hood River, Or.,*	Mechanical Eng.
Larish, Vivienne Gertrude,	*San Francisco,*	Education
Lawrence, Ernest Edward,	*Lompoc,*	Mechanical Eng.

Lay, Lillian E.,	*Rosedale, Wash.*,	English
Leddy, Mary Frances,	*Santa Rosa*,	English
Lee, Francis Valentine T.,	*Victoria, B. C.*,	Electrical Eng.
Lee, Irving Macy,	*Fallbrook*,	Mechanical Eng.
Lesley, Chloe Frances,	*Santa Ana*,	Drawing
Lewis, Mary Emma,	*Portland, Or.*,	English
Limegrover, John Christian,	*Tulare*,	Electrical Eng.
Little, John Chester,	*Dunkirk, N. Y.*,	Mechanical Eng.
Lowe, Mabel,	*Warrensburg, Mo.*,	History
Lübcke, Heinrich Friedrich Albert,	*Hamburg, Germany*,	Mechan'l Eng.
Lunt, Samuel Collins Chase,	*San Francisco*,	Physiology
Macartney, Henry,	*Liverpool, England*,	Drawing
MacCormac, John William,	*Astoria, Or.*,	Ethics
McCormack, Edgar W.,	*Portland, Or.*,	Civil Eng.
McCray, Alfred Marion,	*Oceanside*,	Civil Eng.
McDougall, James Edgar,	*Salinas*,	History
McKay, Willlam Archibald,	*Salt Lake City, Utah*,	Electr'l Eng.
McKenney, Grace,	*San Jose*,	German
McKiernan, Nelly M.,	*San Jose*,	Ethics
McMillan, George,	*Kingston, Mo.*,	History
McPherson, Wallis Daniel,	*San Francisco*,	Electrical Eng.
Madsen, Robert Hansen,	*Aroeskjöbing, Denmark*,	Physiology
Maitland, Louise,	*Palo Alto*,	Education
Mansfield, Walter Allison,	*Mt. Tabor, Or.*,	Latin
Martin, Mary Elizabeth,	*Buffalo, N. Y.*,	Botany
Matchin, Rose Salome,	*National City*,	Education
Matson, Florence Lillian,	*Waterloo, Ind.*,	Physiology
Matthes, Fred Albert,	*Albuquerque, N. M.*,	Mech'l Eng.
Maxwell, Mary Katherine,	*Cleveland, O.*,	Chemistry
May, Cornelia Alice,	*San Jose*,	German
Mayhugh, Stella Mary,	*Kearn's Canyon, Ariz.*,	History
Melkies, Charles,	*Riga, Russia*,	German
Merriam, Florence Augusta,	*Locust Grove, N. Y.*,	English
Miller, Emma Jane,	*San Francisco*,	Physical Training
Miller, Mabel Louise,	*Longville*,	English
Miramontes, Clare,	*Redwood*,	Drawing
Miyahara, Joie Hisataro,	*Hiroshima, Japan*,	Electrical Eng.
Morden, Lucena Mandana,	*Portland, Or.*,	History
Murdock, Edmund Richardson,	*Orland*,	Chemistry
Nash, Frank Channing,	*Spokane, Wash.*,	Economics
Nelk, Carl Nicholas,	*Williams*,	Mechanical Eng.
Noble, Willis Craig,	*San Diego*,	Civil Eng.

Northrop, Minnie,	*Etta*,	English
Nowell, Emily Adelade,	*College Park*,	Education
Nutting, Perley Gilman,	*Randolph, Wis.*,	Physics
Parke, Emily B.,	*Moreno*,	German
Patterson, Clyde Llewellyn,	*Eugene, Or.*,	Mechanical Eng.
Patterson, Grace Sarah,	*Beaver Falls, Pa.*,	Physical Training
Patterson, Mary Alma,	*San Jose*,	Education
Pearson, Harold Peter,	*Chicago, Ill.*,	History
Pearson, John Winfield,	*Oakland*,	Electrical Eng.
Peet, Florita Lindslay,	*San Carlos*,	English
Perrault, Alfred Frank,	*Dayton, Minn.*,	Chemistry
Perry, Clarence Arthur,	*Syracuse, N. Y.*,	English
Phelps, Mary Florence,	*San Carlos*,	English
Pillsbury, Arthur Clarence,	*Auburn*,	Mechanical Eng.
Poindexter, Henry Tyhrie,	*Dillon, Mont.*,	Mechanical Eng.
Porter, Mark Sibley,	*Chicago, Ill.*,	Mathematics
Porter, William Ernest,	*Montreal, Can.*,	Drawing
Powers, Edward Alpha,	*Ipswich, S. Dak.*,	English
Price, William Wightman,	*Oakland*,	Zoology
Quintanilla, Carlos,	*San Francisco*,	Mechanical Eng.
Rand, Frances N.,	*Manitowoc, Wis.*,	Drawing
Rankin, Howard Tomlin,	*Portland, Or.*,	History
Rice, John Ainsworth,	*Fallbrook*,	Electrical Eng.
Richardson, Margaret Watson,	*Palo Alto*,	Chemistry
Ross, Ada Amelia,	*Mayfield*,	Physical Training
Ross, Bert Charles,	*Long Valley*,	Mechanical Eng.
Ross, Sarepta Ione,	*Long Valley*	Drawing
Rossi, Alexander Ferdinand,	*Washoe, Idaho*,	Civil Eng.
Ryland, Gerard Vinton,	*San Jose*,	Electrical Eng.
Sawyer, Houghton,	*San Francisco*,	Electrical Eng.
Scofield, Norman Bishop,	*Washington, Iowa*,	Zoology
Sibley, Elmer Henry,	*Dinuba*,	Civil Eng.
Simkins, Henry Walter,	*Palo Alto*,	Mathematics
Simpson, Joseph Manly,	*Kamloops, B. C.*,	Electrical Eng.
Smith, Elinor Alma,	*Portland, Or.*,	Botany
Smythe, Charlotte Sumner,	*Santa Rosa*,	Education
Snow, Frank Jotham,	*Oakland*,	Electrical Eng.
Soper, William Henry,	*Honolulu, H. I.*,	Electrical Eng.
Sorenson, Olaf Lauritz,	*Honolulu, H. I.*,	Civil Eng.
Southworth, Grace Aileen,	*Stockton*,	Drawing
*Spiger, Huber Clinton,	*Ravenna, Wash.*,	History

*Deceased.

Sprague, Lila Frost,	*San Francisco*,	Philosophy
Sprague, Leslie Willis,	*San Francisco*,	Philosophy
Stanley, Benjamin Barney,	*Menlo Park*,	Mechanical Eng.
Starbird, Ray Wheeler,	*San Diego*,	Electrical Eng.
Starks, Edwin Chapin,	*Chicago, Ill*,	Zoology
Stevens, James M.,	*Blackfoot, Idaho*,	Law
Stewart, Lorena,	*Santa Barbara*,	Drawing
Stokes, Evaline Jane,	*Tia Jauna*,	Education
Stowell, Agnes,	*San Rafael*,	Education
Swain, Edward Lemmon,	*Dinuba*,	Civil Eng.
Thaxter, Alberta,	*Carson City, Nev.*,	Mathematics
Thompson, James Reuben,	*Portland, Or.*	Electrical Eng.
Tobey, Curtis, Jr.,	*Menlo Park*,	Horticulture
Townsend, Bertrand William,	*San Francisco*,	Architecture
Trumbull, Rose May,	*La Grande, Or.*,	English
Tucker, Milo Asem,	*Los Angeles*,	Education
Turner, Harry Coburn,	*Los Angeles*,	Chemistry
Wardall, Ralph Hewitt,	*Duarte*,	History
Warden, Christie E.,	*San Francisco*,	English
Warren, Ella,	*Woodland*,	English
Watson, Frank Milton,	*San Jose*,	Mechanical Eng.
Welch, Horace Herbert,	*Wichita, Kan.*,	Physics
White, James Corbett,	*Honolulu, H. I.*,	Civil Eng.
Wilder, Melvin Dwight,	*Santa Cruz*,	Electrical Eng.
Williams, Emily Eolian,	*San Jose*,	English
Williams, Grant Langworthy,	*Portland, Or.*,	Law
Williams, Olive Augusta,	*San Francisco*,	English
Wilson, John Henry,	*Honolulu, H. I.*,	Civil Eng.
Wilson, Norton Parker,	*The Dalles, Or.*,	Electrical Eng.
Winslow, Thomas Hartley,	*Copenhagen, Denmark*,	German
Witter, Elizabeth Gooding,	*San Carlos*,	English
Wood, Henry Adams,	*Portland, Or.*,	Electrical Eng.
Yakushiji, Yabimi,	*San Francisco*,	Economics
Young, Lena Calhoun,	*Santa Rosa*,	Education
Young, William George,	*San Diego*,	English

SUMMARIES.

BY CLASSES.

GRADUATES	84
UNDERGRADUATES	650
SPECIAL STUDENTS	241
Total (men, 678; women, 297)	975

BY MAJOR SUBJECTS.

	Graduates	Undergraduates	Specials	Total	*No. of Students in all classes	*Total reg'str'n in all classes
Greek	—	14	1	15	40	54
Latin	10	40	4	54	104	136
Archæology	—	—	1	1	27	27
German	6	20	6	32	327	363
Romanic Lang.	1	9	2	12	247	261
English	16	109	32	157	393	558
Psychology	1	3	—	4	5	10
Ethics	2	3	3	8	112	125
Philosophy	—	1	3	4	119	123
Education	1	16	20	37	71	94
History	5	82	21	108	289	393
Economics	7	44	5	56	202	255
Law	3	35	8	46	65	65
Mathematics	5	30	5	40	225	324
Astronomy	—	1	—	1	9	10
Physics	2	4	2	8	105	106
Chemistry	4	25	12	41	194	219
Botany	1	10	5	16	36	42
Entomology	1	1	—	2	—	—
Horticulture	—	1	2	3	—	—
Physical Training	—	1	5	6	293	309
Physiology	6	46	7	59	86	113
Zoology	3	11	3	17	27	31
Geology	5	5	2	12	76	97
Drawing	2	12	17	31	96	108
Mining Eng.	—	6	1	7	—	—
Civil Eng	2	44	21	67	155	180
Mechanical Eng	1	37	25	63	106	139
Electrical Eng.	—	40	28	68	22	44
Military Science	—	—	—	—	137	145

*First Semester.

BY RESIDENCE.

California	576	Kentucky	2
Oregon	60	Michigan	2
Washington	37	New Jersey	2
New York	31	New Mexico	2
Indiana	28	West Virginia	2
Illinois	26	Arkansas	1
Iowa	24	Florida	1
Ohio	18	Mississippi	1
Missouri	15	North Carolina	1
Nevada	14	South Carolina	1
Colorado	10	Tennessee	1
Pennsylvania	9	Texas	1
Kansas	7	Virginia	1
Wisconsin	7	Canada	14
Montana	6	Japan	8
Arizona	5	Hawaiian Islands	7
District of Columbia	5	Brazil	3
Maine	5	Germany	3
Massachusetts	5	Denmark	2
Nebraska	5	Scotland	2
Vermont	4	France	1
Idaho	3	Ireland	1
Minnesota	3	Italy	1
New Hampshire	3	Mexico	1
South Dakota	3	Russia	1
Utah	3	England	1

CALIFORNIA BY COUNTIES.

Alameda	33	San Benito	1
Butte	3	San Bernardino	14
Contra Costa	2	San Diego	33
Colusa	3	San Francisco	59
Fresno	9	San Joaquin	18
Glenn	2	San Luis Obispo	10
Humboldt	8	San Mateo	15
Kern	2	Santa Barbara	12
Kings	1	Santa Clara	181
Lake	2	Santa Cruz	12
Lassen	2	Sierra	1
Los Angeles	44	Solano	4
Marin	1	Sonoma	14
Mendocino	5	Siskiyou	2
Merced	1	Stanislaus	3
Monterey	4	Sutter	1
Napa	6	Tehama	1
Orange	13	Tulare	9
Placer	2	Ventura	2
Plumas	1	Yolo	3
Riverside	18	Yuba	7
Sacramento	12		

Second Annual Commencement.

May 31, 1893.

COMMENCEMENT ADDRESS - Professor GEORGE ELLIOTT HOWARD.
"The American University and the American Man."

DEGREES CONFERRED.

BACHELORS OF ARTS.

In Greek:

Ellsworth Lincoln Rich, *Mayfield.*

In Latin:

Carrie Adeline Bean, *San Jose.*
Elizabeth Louise Boardman, *Reno, Nev.*
Leslie Moulthrop Burwell, *Sacramento.*

In German:

Henry R. Timm, *Dixon.*

In English:

Lucius Ward Bannister, *Des Moines, Ia.*
Arthur Henry Barnhisel, *San Jose.*
Richard Twells Buchanan, *Logansport, Ind.*
Murray Adrian Campbell, *Des Moines, Ia.*
Olin Whitefield Marsh, *Santa Cruz.*

In History:

Robert Lyon Gruwell, *Lower Lake.*
Charles Henry Hogg, *Saratoga.*
John A. Nowell, *College Park.*
Carl Schurz Smith, *Eugene, Or.*
Walter Olcott Smith, *Detroit, Mich.*
William Leander Webster, *San Jose.*
Clarke Butler Whittier, *Riverside.*
John Kinlay Wight, *Toronto, Can.*

In Economics and Social Science:

Wallace Somerville Faris, *San Francisco.*

In Mathematics:

Wellyn Brayton Clark, *Castorland, N. Y.*
Wilbur James Edwards, *San Jose.*
George B. Miller, *Kokomo, Ind.*
Frances Morgan Swain, *Palo Alto.*
Arthur Henry Washburne, B. S., *San Jose.*

In Zoology:

Clelia Duel Mosher, *Palo Alto.*

In Geology:

Albert Homer Purdue, *Yankeetown, Ind.*

In Mechanical Engineering:

Edgar Park Coleman, *Decatur, Ill.*
Charles Edwin Houghton, *Philadelphia, Pa.*
Sanford K. Kenower, *Huntington, Ind.*
Arthur Rodney Sawyer, *Bunker Hill, Ill.*

MASTERS OF ARTS.

In Romance Philology:

Thérèse F. Colin, *New York City.*

In German:

Oscar Magnus Benzon, A. B., *Newell, Ia.*

In Education:

John Allen Hancock, M. L., *Green Bay, Wis.*

In History:

Albert James Brown, A. B., *New London, Ind.*
Charles Ernest Chadsey, A. B., *Nebraska City, Neb.*
Ernest Dorman Lewis, A. B., *Evansville, Ind.*
Jessie Elleanor Russell, Ph. B., *San Jose.*

In Economics and Social Science:

William James Hannah, A. B., *Davison Mich.*

In Mathematics:

Charles Ellwood Cox, A. B., *College Park.*
Frank Horton Foster, A. B., *Woodruff, Ind.*
John Anthony Miller, A. B., *Palo Alto.*

In Physics:

Carl Lane Clemens, Ph. B., *Manchester, Pa.*
Daniel William Murphy, A. B., *Butler, Ind.*
Herman De Clercq Stearns, A. B., *Joliet, Ill.*

In Zoology:

Frank Cramer, B. L., *Appleton, Wis.*

In Geology:

Claude Ellsworth Siebenthal, A. B., *Bloomington, Ind.*

In Physiology:

Stewart Daniel Briggs, A. B., *College Park.*
Fred Grant Burrows, A. B., *Chualar.*
Charles Wilson Greene, A. B., *Ireland, Ind.*
Frank Mace McFarland, A. B., *Olivet, Mich.*

MECHANICAL ENGINEER.

Louis Alexander Buchanan, *Palo Alto.*

MID-YEAR CONFERRING OF DEGREES.

January 10, 1894.

BACHELORS OF ARTS.

In Latin:

Anna Lena Lewis, *Warrensburg, Mo.*
Helen Elizabeth Slayton, *Stowe, Vt.*

In Economics and Social Science:

Andrew Edgar Averett, *San Jose.*

In Physiology and Histology:

*Henry Powers Hammond, *San Francisco.*

*Work completed, August, 1893.

Alumni Association.

Organized June 15, 1892.

President,	Charles Ellwood Cox, '93
Vice-President,	Jessie Eleanor Russell, '93
Secretary,	Clelia Duel Mosher, '93
Treasurer,	Charles Wilson Greene, '92

CONSTITUTION.

In order to perpetuate a feeling of regard for one another, and of attachment to our *Alma Mater*, we do hereby form ourselves into an association to be known as the Alumni Association of Leland Stanford Junior University.

1. All persons who have received a degree from Leland Stanford Junior University are members of this Association.

2. All members of the Faculty are honorary members of this Association.

3. The officers of this Alumni Association shall be a President, Vice-president, Secretary, and Treasurer.

4. There shall be an Executive Committee, to consist of the following persons: the President of the Association, chairman; the Secretary of the Association, secretary; and the Treasurer of the Association.

5. It shall be the duty of the Executive Committee to arrange for the literary programme to be presented on Alumni Day; to arrange for an annual banquet to be given on the evening of Commencement Day; to regulate the finances of the association; and to perform such other duties as may be imposed upon them by the association.

6. The officers of the Alumni Association shall be elected by ballot, a majority of all votes cast being necessary for election. Elections shall take place at the annual meeting.

Index.

Admission, conditions of, 26.
on certificate, 34.
on examination, 26.
as special students, 35.
to advanced standing, 35.
to graduate standing, 36.
Alumni Association, 154.
Archæology, 49.
Astronomy, 83.
Athletics, 93.
Botany, 89.
Buildings, 21.
Catalogue of Students, 122.
Calendar, 5.
Certificates, Admission on, 34.
Chapel Services, 24, 114.
Chemistry, 86, 119.
Christian Associations, 25.
Civil Engineering, 103.
Commencement, second annual, 151.
Council, University, 24.
Courses of Instruction, 43.
Degrees, 37, 38.
Departments, 25, 43.
Directory, 4.
Dormitories, 21, 41.
Drawing and Painting, 101.
Economics and Social Science, 74.
Education, 67.
Electrical Engineering, 110, 120.
Endowment of University, 20.
Engineering, civil, 103.
electrical, 110, 120.
mechanical, 108.
mining, 100.
English, 56.
Entomology, 91.
Ethics, 64.
Examinations, entrance, 26, 33.
Expenses, 40.
Faculty, 7, 24.
Fees, 40, 86, 89, 90, 92, 97, 99, 100, 101, 111.
Foundation of University, 19.
Founders, 6.
French, 53.
Geology, 99.
German, 50.
Government of Students, 24.
Graduate Students, 36, 38, 122.
Graduation, 37.
Greek, 43.
Gymnasiums, 22, 93.
History, 69.
Hopkins Seaside Laboratory, 25, 116.
Horticulture, 92.
Hygiene, 93, 121.
Instruction, courses of, 43.
Italian, 55.
Laboratory fees, 41, 86, 89, 90, 92, 97 99, 100, 101, 111.
Latin, 45.
Law, 77.
Lectures, University, 113.
Library, 22.
Location, 20.
Mathematics, 80, 119.
Mechanical engineering, 108.
Medical course, preparatory, 97.
Military science and tactics, 112.
Mining engineering, 100.
Museums, 22, 99.
Organization and administration, 19.
Organizations, general student, 25.
Partial standing, 33.
Physics, 85.
Physical Training, 93, 121.
Physiology, 95.
Psychology, 64.
Registration, 36.
Religious Services, 24, 114.
Romanic Languages, 53.
Sanskrit, 50.
Scientific collections, 23, 92, 99.
Self-support of students, 41.
Shorthand, 64.
Spanish, 54.
Special students, admission of, 35.
Standing Committees of Faculty, 17.
Students, catalogue of, 122.
Student organizations, 25.
Summaries, 149.
Summer Courses, 119.
Trustees, 6, 23.
Tuition, 40.
University Associations, 116.
University Chapel, 24, 114.
University Lectures, 113.
University Extension, 112.
Zoology, 98.

University Publications.

The Tariff Controversy in the United States, 1789-1833. With a Summary of the Period before the Adoption of the Constitution. By ORRIN LESLIE ELLIOTT, Ph. D., pp. 272. Price, $1.00.

Observations on the Conductivity of a Copper Wire in Various Dielectrics. By FERNANDO SANFORD, M. S., pp. 44.

The American University and the American Man. Second Commencement Address. By GEORGE ELLIOTT HOWARD, A. M., pp., 22. Price, Fifteen Cents.

Entrance Requirements. A pamphlet explaining in detail the requirements for admission.

Specimen Examination Questions. 1892, 1893.

Schedule of Lectures and Recitations and Directory, for 1894-95. Price, Ten Cents. [Ready May 20.]

The University Register.

ADDRESS

THE REGISTRAR,

Stanford University, California.